K A N S A S

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DEPARTMENT OF HEALTH AND ENVIRONMENT

KATHLEEN SEBELIUS, GOVERNOR

Responses to Public Comments

on the

Application by Waste Connections of Kansas, Inc.

for a

Permit to Construct and Operate a Municipal Solid Waste Landfill

known as

Plumb Thicket Landfill

in

Harper County, Kansas

located

North of NE 150th Road
In the west half of Section 3 and the east half of Section 4,
Township 31 South, Range 6 West

Permit No. 842

September 2, 2005

DIVISION OF ENVIRONMENT
Bureau of Waste Management
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The Kansas Department of Health and Environment (KDHE) has issued the above-referenced permit. This document provides responses to the public comments received by KDHE during the public notice period. All individuals who submitted public comments or requested notification of the permit decision and responses were issued a letter notifying them about the availability of this document.

Summary

KDHE received a total of 317 discrete units of communication (e-mails, faxes, letters, verbal testimony at hearing, etc.) qualifying as public comments. Some of those were postcards or other items containing essentially one comment, while others contained multiple comments. Several letters and reports contained hundreds of comments. Questions were considered the same as comments. Approximately one-third of the comment documents were duplicates or triplicates, such as when an individual submitted the same letter to the Bureau of Waste Management, the Secretary of KDHE, and/or the Governor. Many of the documents were also redundant even if they were submitted by different individuals, as in the case of mass-produced postcards and form letters.

Of the 317 units of public comments:

- 290 expressed opposition to the landfill
- 20 expressed support of the landfill
- 7 did not indicate a position (e.g., just a request for notice of final decision and responses)

The most common concerns were as follows (not necessarily in order of prevalence or significance):

- Potential impacts to the Chikaskia River/drinking water
- Potential impacts to groundwater/drinking water
- Types of waste that could be accepted
- Compliance history and character of Waste Connections
- Traffic safety and related concerns
- Allegations of financial incentives for state issuance of permit
- Challenges to the local government's zoning process
- Possible environmental impacts
- Concerns about financial assurance
- General opposition to landfills, etc.
- Concerns about fairness, property impacts, etc.
- Geological issues
- Siting, design, and performance questions
- KDHE's mission and the need for landfills
- Issues with the application process, etc.

- Natural gas pipeline and other utilities on the site
- Preservation of natural/recreation land
- Wildlife issues
- Questioning the effectiveness of corrective action
- How inspections and complaints would be handled
- Pollution and disease through various pathways

The comments in favor of the proposed landfill were as follows (not necessarily in order of prevalence or significance):

- Financial boost for county
- Opposition is from a vocal minority based on emotion instead of facts
- Confidence in liner and construction techniques
- Settlement reached on gas pipeline relocation
- Confidence in KDHE's review and oversight
- Low population density compared with Sedgwick County
- Lack of aviation industry as compared with Sedgwick County
- Legal standing of the county's zoning action
- Confidence based on visit to another Waste Connections landfill
- Geology and design protective of human health and the environment

The public comments were reviewed by KDHE prior to issuing the permit. Responses to the public comments are provided below.

Comments and Responses

Due to the volume of comments, this document does not address each individual comment. Instead, KDHE selected representative comments and prepared responses to those. This approach has been used in the past and is consistent with K.A.R. 28-29-6a(d).

Some comments have been paraphrased to clarify the meaning or context. Comments are presented below in italics, with responses following each comment in standard typeface. To avoid repetition, the responses to many comments refer to previous comments which contain relevant information.

1. Potential Impacts to the Chikaskia River

a. The Chikaskia is the only unpolluted river in the state.

The Chikaskia River is one of about 36 streams in Kansas that is listed as an Exceptional State Water as defined by KDHE/Bureau of Water. In south central Kansas; the Chikaskia River in Harper and Butler Counties, the Caney River in Chautauqua and Elk Counties, Cedar Creek in Chase County, the Fall River in Elk, Greenwood, and Wilson Counties, Grouse Creek in Cowley County, the

Medicine Lodge River in Barber and Kiowa Counties, are listed as streams of good to high water quality by the National Park Service's Rivers, Trails & Conservation Program.

b. *The Chikaskia River is a part of the 3% of Kansas rivers not polluted.*

KDHE cannot find any information to support this statement. See previous comment.

c. *What is the distance of the proposed landfill site to the Chikaskia River?*

At its closest point, the Chikaskia River is 1.7 miles to the east of the site, but is approximately 3 miles away in the groundwater flow direction to the southeast.

d. *Flooding of the Chikaskia River could affect proposed landfill.*

The Chikaskia River would have to rise 130 feet in elevation to reach the lower eastern side of the Plumb Thicket site.

e. *The site is close to the headwaters of the Chikaskia River.*

The headwaters of the Chikaskia River are over 35 miles to the west-northwest of the site in southeastern Pratt County.

f. *The proposed landfill site is too close to the Chikaskia River.*

The river is approximately two miles away from the monitored site. KDHE approved the proposed groundwater monitoring well network as protective of the river and surrounding area.

g. *The Chikaskia is the purest, cleanest river in the state of Kansas. We must preserve the natural resources in this region and protect the drinking water for the communities that depend on it.*

The Chikaskia River is an important natural resource. Plumb Thicket Landfill is located approximately two miles from the Chikaskia River at its closest point. Hydraulically, the landfill is located approximately three miles from the Chikaskia River, since surface water and groundwater do not flow along the shortest straight-line distance. The bedrock below the landfill was investigated extensively and was found to have very low permeability – that is, any liquid released from the landfill to the subsurface would move extremely slowly, at a rate of approximately four feet per year.

Such a release is not expected, because the landfill will have a composite liner system (high density polyethylene sheeting over compacted clay), meeting state and federal requirements. In addition, leachate (the moisture that seeps from trash in the landfill) will be pumped off the liner and managed in an approved manner to further reduce the potential for leaks. Groundwater monitoring wells will be situated around the landfill and periodically sampled

to determine whether any contamination is present in the groundwater at the facility. If any groundwater contamination is detected, further investigation will be performed to determine the source and appropriate corrective actions will be implemented to prevent impacts to human health or the environment. Storm water controls will also be used to prevent discharge of pollution from the landfill property. All of these measures will protect the Chikaskia River and drinking water supplies.

h. *I know that your position is that all runoff from the landfill will be contained, but we all know that is impossible.*

All runoff from the landfill property will not be contained.

Runoff from landfill areas with exposed waste or less than 12 inches of soil cover over waste – in other words, runoff that state regulators call "leachate" – will be contained up to and including the 25-year, 24-hour storm event (6.2 inches of rain in 24 hours). Leachate will be contained primarily through the use of surface grading and berms. As previously noted, leachate will be collected and managed in an approved manner such as disposal at a wastewater treatment plant or recirculation in the waste to enhance waste decomposition.

Runoff from offsite areas and undisturbed onsite areas will be diverted around the active areas of the site.

Runoff from onsite disturbed areas (areas of bare soil) that are either waste disposal areas having 12 inches or more of soil cover or are not waste disposal areas (e.g., roads, parking, soil stockpiles, etc.) will be treated with appropriate "best management practices" (BMPs) before being discharged. The primary treatment approach will be temporary storage in detention ponds to provide sediment removal prior to discharge. Other BMPs will include silt fences, hay bales, seeding, terraces, let-down channels, etc. to minimize erosion. These are standard procedures for managing storm water runoff from many types of construction projects including commercial developments, highways, landfills, etc.

To better characterize the drainage from the proposed landfill site, a fourth surface water sampling site (SW-4) will be required for the intermittent stream at a location in the NW ¼ of the SE ¼ of Section 3 to detect any possible contamination derived from drainage along the eastern side of the landfill area.

i. *Could gages be put at the pathway of the Chikaskia River and K-2 Highway so bacteria and contaminants could be monitored? How often would this test be conducted?*

The United States Geologic Survey (USGS) is responsible for stream gages that measure flow and water stage. The KDHE Bureau of Environmental Field Services (BEFS) samples and analyzes water quality in streams. You may want to contact those agencies if you have further questions about stream gages and water quality monitoring. The only USGS Chikaskia River gaging station in Kansas is approximately 25 miles downstream from the proposed landfill site. The KDHE-BEFS samples the Chikaskia near Runnymede,

approximately 3 miles from the proposed landfill site, and analyzes the water for inorganics six times a year and organics three times a year.

j. Will KDHE issue a permit knowing the possibility of infringement upon the water rights of people in Townships 31-5, 32-6, 31-6 and communities on down stream? Who will be held responsible if the people lose their water supply?

This landfill is not expected to infringe upon water rights or impact water supplies. Evaporation from the proposed storm water retention pond at the landfill is anticipated to represent a small "use" of water, and will be subject to prior approval by the Kansas Department of Agriculture, Division of Water Resources.

k. No thickness of a trash liner laying on top of water will hold up in these trash cells due to wild animals (rodents), leachate of the composing trash, and periodic flooding of the Chikaskia River.

The liner system will not be situated on water. It will be constructed on a solid foundation of compacted clay over bedrock.

The liner system will not be accessible to animals, as it will be covered with at least 12 inches of sand. After the liner is constructed and approved, municipal solid waste will be placed and compacted over the liner, further inhibiting access to the liner. Also, landfill liner systems are not known to attract animals and it would be very difficult for an animal to penetrate the liner system.

The landfill is significantly higher than the Chikaskia River flood plain. Therefore, flooding in the river will not affect the landfill liner integrity.

l. I run cattle on the Chikaskia River. My cattle probably drink about 6,000 gallons of water a day out of that clean river. I am concerned of the possibility of contamination.

There are many anthropogenic (man-made) activities that could cause stream impairment of the Chikaskia River, including agricultural practices, industrial operations, leaking private septic tanks, and public wastewater treatment plants. As previously noted, the landfill is not expected to impact the Chikaskia River due to the distance and pollution prevention measures at the landfill.

2. Potential Impacts to Groundwater or Drinking Water

a. The proposed landfill site overlays the Ogallala Aquifer.

The Plumb Thicket site does not overlay the Ogallala aquifer.

b. Who is in charge of groundwater monitoring?

Waste Connections is responsible for the sampling and water level measurements of the wells in the groundwater monitoring system. The samples must be submitted to a Kansas certified analytical laboratory. Both the sampling and laboratory analysis has checks and balances to ensure representative results including duplicate and trip samples, and quality assurance of laboratory analyses. KDHE Bureau of Waste Management oversees the sampling and periodically collects split-samples for submission to the Kansas Health and Environment Laboratory.

c. The proposed landfill site is on or will adversely affect a drinking water aquifer.

The Permian bedrock aquifer yields small quantities of water inadequate for domestic use.

The Pleistocene overburden (clay, silt, sand, and gravel overlying the bedrock) is thinly saturated at its base along the hill tops and ridge in the main part of the proposed landfill area. The thinly saturated zone is discontinuous, varies in thickness, and appears to be perched on the low permeability clays of the underlying bedrock. The water in the thinly saturated overburden can leave through transpiration by plants, by discharge as seeps along the top of the outcropping bedrock at the edge of the overburden, and as slow leakage through the top of the underlying bedrock. The saturated portions of the overburden in the main area of the landfill may not be considered an aquifer because they are too thin to practically yield water and the water level in a well screened within the deposits may not recover substantially within 24 hours (KDHE Solid Waste definition of an aquifer requires recovery within 24 hours). This is because the only substantial lateral flow that could supply water for the recovery is along the ridge direction from the north-northwest; ground-water flow is away from the ridge top in all of the other directions. In an extended dry period, ground-water discharge and transpiration could diminish the saturated thickness to near zero or zero. The overburden aquifer within the landfill property is recharged solely on that property and pinches out within the property boundaries. Therefore, the overburden groundwater on the landfill property could only be used by the property owner; the landfill property owner does not plan to use the overburden groundwater.

The Chikaskia River alluvial aquifer is more than two miles away from the site. This alluvial aquifer has poor hydraulic connection to the overburden and the bedrock aquifers at the site. The well network will adequately monitor groundwater under the landfill.

d. Any evidence of PCE contamination in the groundwater at the site?

Tetrachloroethene (PCE) is a man-made volatile organic compound (VOC). No VOCs have been detected at the site.

e. Could the proposed landfill contaminate the Equus Beds?

No. The Equus Beds are north of Harper County in Kingman, Sedgwick, Harvey, and Reno Counties. Groundwater flow at the proposed landfill is to the southeast.

f. Due to the groundwater flow velocity, a leak from the proposed landfill would go undetected for 182 days between semi-annual sampling events.

Due to the tight formation, slow groundwater flow velocity, and the close spacing of the groundwater monitoring wells in the network, the contamination should be detected long before crossing the 1000 foot buffer zone between the landfill edge and the property boundary.

g. How does quarterly sampling work?

Waste Connections was required to collect groundwater samples every three months for a year prior to placement of any waste at the proposed landfill site. This provides both an indication of seasonal variation in groundwater flow and background values for any pre-existing groundwater contaminants. KDHE oversees and reviews the data from these sampling events.

h. Does quarterly sampling take into account seasonal variations and drought conditions?

Quarterly sampling will help define seasonal variations in groundwater flow. If there is long-term drought, the single year of sampling may not characterize groundwater flow during normal or high precipitation years. Semi-annual sampling of the landfill would provide that information.

i. Does the public drinking water intake requirement take into consideration private wells used for rural homes and farming operations?

No. However, groundwater monitoring at the site is designed to detect any groundwater contamination prior to reaching the property boundary and any offsite wells.

j. What regulations are in place to protect rural wells from the landfill?

The Kansas Administrative Regulations 28-29 Part 7: Regulations for Location, Operation, Design, Groundwater Monitoring, and Closure/Post-closure of Municipal Solid Waste Landfills. Part 7 provides landfill location restrictions, design and operation standards, and requirements for groundwater monitoring systems, corrective action, and closure. In total, these regulations are designed to protect groundwater both under the landfill property and all properties downgradient of the landfill.

k. How will this proposed landfill affect subsurface moisture in the surrounding farmland?

Groundwater flow in the bedrock and surface flow will continue. Any changes in the overburden aquifer groundwater flow should be minimized through engineering controls.

l. What if this landfill construction and operation causes water level rise in other areas?

The water balance for the area should remain the same. There may be a slight change in groundwater or surface water flow within the overburden when the proposed landfill is constructed and storm water is diverted. See Comment 2c.

m. How can KDHE know, with any kind of certainty, what kind of domino effect that may have on the environment.

The groundwater will be monitored throughout the active life and post-closure care period of the landfill.

n. Why are there no wells in the northeast corner of the proposed landfill?

Groundwater monitoring wells MW-19 and MW-21 and piezometers PZ-2, PZ-16, and PZ-20 are on the northeast edge of the landfill footprint.

o. What happens if a leakage plume goes between the monitoring wells and is not detected by the bi-annual samplings?"

The monitoring well network of at least 23 wells surrounding the proposed landfill footprint is designed to detect any contamination prior to reaching the property boundary. Groundwater is analyzed for constituent concentrations below the drinking water standards, which provides an additional safeguard. See Comment 2x.

p. Has groundwater gradient been checked since 1960?

As part of the hydrogeologic investigation for this landfill permit application, site-specific groundwater gradient was measured in 2002 through 2003 and recently in February 2005. All groundwater flow data is consistent with the 1960 information.

q. How much leachate is allowed in groundwater?

None is allowed. Any confirmed detectable groundwater contamination will be investigated and any contaminant plume fully characterized.

r. If the proposed landfill liner leaks, what is the affect on the watershed?

Groundwater analyses will determine the impacts and any corrective action needed on a case-by-case basis.

s. How often does KDHE check the monitoring wells?

The split-sampling is scheduled on a case-by-case basis and depends on the site history and geologic conditions. The owner has collected quarterly groundwater samples to establish

baseline conditions. If a permit is issued, the owner will be required to sample semiannually in accordance with regular detection monitoring and groundwater protection standards.

t. *The landfill will be setting on a very fragile area that has shallow groundwater.*

The landfill will be located on a solid foundation of compacted clay over bedrock. The lowest point of the landfill will be at least seven feet higher than the underlying water table. In the overburden aquifer remaining in the northeast section (panhandle) of the proposed landfill, Waste Connections must demonstrate that the base of the landfill is and will remain seven feet above the groundwater.

u. *Groundwater is only going to move laterally six feet per year or something like that. I don't quite buy that and anybody who has ever took a statistics class knows that you can make numbers say whatever you want them to say.*

All investigated results show a very slow groundwater flow rate in the bedrock aquifer. Other high yield wells in the area are screened in different formations.

v. *How often does the Department check the wells?*

KDHE staff typically take samples from groundwater monitoring wells at landfills once per year.

w. *The rules and regulations require continuous samples or at least a sample every 5 feet [in the Phase I Hydrogeologic Investigation]. Some of the logs show the 5-foot criterion was not met (i.e. Pz-15, Pz-8, Pz-5d, etc.). Will the drilling sites which do not meet the criteria be redone or does KDHE plan to accept the data as is?*

KDHE is satisfied that a sufficient number of cores were recovered to adequately characterize the site. In some cases, non-cored borings were placed adjacent to cored borings. Some cores could not be recovered from down-hole; this often occurs in hard rock drilling.

x. *Based on the data from BH1 and Hydrogeologic Profile G-G' (Figure III-12) this boring actually extends through the uppermost aquifer, through the uppermost Permian aquifer and terminates in the lower Permian. Data from the logs and hydrogeologic profiles A-A', C-C' and G-G' clearly indicate there are three different aquifers at the site.*

Strata within the bedrock that contain coarser silt and that are fractured (as indicated by the borehole logs for the proposed landfill site) are expected to have higher horizontal permeability than the finer silt and clay layers. The lateral permeability is expected to be greater than the vertical permeability as typical for horizontal clastic strata containing clay. The vertical permeability is expected to be greatest along fractures in the strata. Golder and Associates (2002) reports the permeability of different zones of the aquifer, including those containing observed fractures, based on aquifer tests. Groundwater levels in the bedrock are

below the top of the siltstone in the main part of the landfill and immediately adjacent area, except just outside the northeast part of the landfill site, where the wells are in a stream valley, and in the northwest, panhandle part of the landfill site. The water levels at these locations are near the top of the bedrock. The water level in the siltstone is below that in the saturated overburden across the landfill area. In general, the deeper an observation or monitoring well is screened in the bedrock, the lower the water level.

At least two additional bedrock monitoring wells screened across the depth of the landfill base and located just outside the southeast corner of the landfill site will be required to ensure that groundwater monitoring could detect any leachate contamination that would flow horizontally within a more permeable portion of the Permian siltstone above a low-permeability clay-rich layer extending above the elevations of the sand-packed intervals of the existing wells. This will allow interception, and possible sampling, of any groundwater at the same elevation as the excavation.

y. These wells also show the head differential respective to each of the targeted aquifers.

See Comment 2x.

z. The logs from Pz-4s, Pz-6d and Pz-17 indicate there is perched water above the main Pleistocene aquifer. Specifically the log for Pz-4s indicates there is water present at 24 feet below land surface (bls) and at 37 feet bls. Until there is documentation to verify the presence or absence of ground water at the 24-foot interval we have to assume it is present. This is a reasonable assumption because wherever a shallow well has been installed, with the exception of MW-5s, the uppermost Pleistocene aquifer has ground water present. Based on the well completion form for Pz-4s the upper ground water at this site was grouted out. The logs for Pz-17 and Pz-6d&s exhibit the potential for perched ground water also. Since the perched ground water aquifers have not been delineated and evaluated the application should be denied.

In the western part panhandle area of the northwest portion of the proposed landfill site, the saturated thickness of the overburden deposits can somewhat exceed 10 ft during wetter periods. The saturated interval includes fine to medium sand with clay lenses and less than a foot of coarse sand and gravel at its base based on the lithologic logs for wells PZ 4s and PZ 12s. The westernmost part of the panhandle area of the landfill could be considered a marginal aquifer for small volume uses such as for domestic purposes or a supply for a small number of stock (see Comment 2c). However, during dry periods, the water levels can drop such that the saturated thickness could become so thin that it would be difficult to produce water from a well in the overburden deposits at this location. The overburden aquifer thickens to the west and becomes an aquifer at a distance outside the landfill area, as indicated by KGS Bulletin 143 (Bayne, 1960). Bayne shows the zero edge of the saturated thickness of the Pleistocene sediments to be at the west side of the proposed landfill site, which, at the level of the county map that he produced, is consistent with the detailed study of the landfill area. The sub-regional groundwater flow direction in the overburden deposits

west of the landfill is generally to the east. The recharge of the overburden deposits both within the landfill site and to the west is local infiltration of precipitation.

The future plans for the landfill in the panhandle area involve construction of disposal cells without complete removal of the overburden. Therefore, the cells will be located over the marginal overburden aquifer. The separation distance between the bottom of the cells and the groundwater table may not meet the seven-foot separation requirement. For example, Figure 1-2 in Golder & Associates indicates that the depth of the overburden underlying the base of the landfill cell in the panhandle part of the landfill will be about 12-14 ft at the location of well PZ 4s (within the 5-15 ft zone near the northwest boundary with the 15-25 ft zone). The saturated thickness of the Pleistocene deposits is usually about 10 ft, based on the water-level measurements made to date at this well, which would result in a separation distance of only 2-4 ft. Concerns related to this issue include groundwater flow within the remaining overburden sediments underlying the landfill such that water-levels could abut the bottom of the landfill liner and the potential lack of clay below the liner in this area depending upon the amount and lithology of the remaining overburden.

At least four overburden wells and two bedrock wells are required to monitor the groundwater in the panhandle and a special condition of the permit has been added to require a demonstration that the water within the overburden will not be less than seven feet from the planned base of the landfill.

aa. *If you look at the hydrogeologic profiles you will see the three aquifer phenomenon adequately represented by the water level head differentials associated with PZ 1s, Pz-1d, Pz-13 and Pz-15 on G-G', Pz-1s, Pz-1d, and Pz-11 on C-C'. Hydrogeologic profile A-A' illustrates there are three potential aquifers when you compare the water levels in MW-28, MW-14, and Pz-15. MW-28 also indicated a potential hydraulic interconnection between the uppermost Pleistocene aquifer and the upper Permian aquifer.*

See Comments 2x & 2z.

bb. *Based on the logs and the hydrogeologic profile E-E' the upper Permian aquifer does not appear to be monitored in the southern portion of the proposed landfill footprint.*

See Comment 2x.

cc. *The log also shows BH3 was drilled over a two day period with the boring being advanced to 80 feet the first day. At the start of the second day the water level was measured in the borehole and recorded as 40 feet bls"…"Is the 40 foot water level in Pz-3 due to downward drainage of the uppermost aquifer or is it associated with the upper Permian aquifer?*

Both perched and bedrock groundwater no doubt contributed to the water initially found in the boring. However, water later found in the completed piezometer Pz-3d, installed in borehole BH3, came exclusively from the bedrock aquifer in which it was screened.

dd. Unless the upper Permian aquifer is better delineated and evaluated in the southern portion of the proposed landfill footprint this application should be denied.

See Comment 2x.

ee. In reference to historical data Golder Associates state: 'Based upon information obtained from the Kansas Geological Survey (KGS) Oil and Gas Database, and from White Pine Petroleum Corporation (White Pine) of Wichita Kansas, three decommissioned wells exist within or adjacent to the proposed landfill footprint.' We were not able to find Golder Associates documentation for the plugged wells at this site. We went to the KDHE database to try and locate the source of the data. We are not sure which database they reviewed but the one we found shows the three wells listed plus an additional 7 others.

The three wells are within the footprint and the seven additional wells are not in the planned footprint of the proposed landfill. See Comment 2gg.

ff. Until the Kansas Corporation Commission (KCC) has had an opportunity to review and provide comments regarding this application should it be approved?

The KCC was notified about the proposed landfill and expressed no concerns.

gg. We have included pictures of a potential seismic shot hole site in Exhibit TRC 2.2.4. These pictures were taken during our brief visit in December 2002 and show the top end of a piece of drill pipe sticking out of the ground. Based on the seismic survey map for the area this location appears to be very near a shot hole location 521. This may be a good place to start looking at the potential impact of the shot holes.

To fully define any conduit for contaminant flow, KDHE will require a full demonstration from Waste Connections prior to construction in the areas where overburden is proposed to remain (i.e., the "panhandle"). Also, all borings will be identified and properly abandoned (over-drilled and grouted) in the proposed landfill footprint in accordance with the February 25, 2005 work plan, which states:

"Heavy equipment operators, both during day-to-day excavation (e.g., for daily cover materials) and during cell construction activities, will be trained and directed to be on the lookout for any signs of old boreholes. They will be required to immediately mark (with stake or similar) the location of any such features and report it to the site manager. Then, upon probing and confirming that a borehole does exist, the location will be staked and surveyed. This area will be closely tracked during subsequent excavation. If, upon reaching the design base excavation grades, the borehole is no longer observable, it will be concluded that the boring or well is shallower than the excavation and that it was completely removed. If, at the base of the excavation, signs of the borehole still exist, a drill crew will be mobilized to properly seal (over-drill and thoroughly grout) the borehole or well as described in Section 11.1 of Appendix I-D (CQA Plan) of the January 2003 application. Abandonment

of any seismic boreholes or other historic boreholes will be documented as part of the Construction Quality Assurance (CQA) report for subgrade acceptance.

"Further measures to identify potential historic boreholes will be taken once design subgrade elevations have been reached during each phase of construction. At that point, the subgrade will be smoothed with a motor grader, and then thoroughly inspected for any signs of depressions or actual boreholes. This inspection will be performed by trained personnel traversing the subgrade on a 25-foot grid pattern, at a walking pace, and visually examining the entire subgrade. This will be documented as part of the CQA report for subgrade acceptance. Any boreholes or wells observed will be over-drilled and properly sealed and documented, as indicated above.

"The above language detailing the practices to be employed to detect seismic boreholes, oil/gas wells, and possible other vertical borehole-type features has been added to Section 11.1 of the CQA Plan (Appendix I-D) and Section 2.1 of the Operations Plan (Appendix I-F)."

hh. Did Golder Associates receive the survey data from their seismic data source?

No.

ii. Seismic shot holes and core holes have been known to be potential contamination sources and/or pathways. In a report titled ABANDONED WELL AND EXPLORATORY HOLE SURVEY prepared for the 1952 Legislative Council Metzler et al., says 'Numerous core and seismic holes were found which facilitated wide spread pollution.

See Comment 2gg.

jj. As stated above we were contacted by Mrs. Jelinek after she had visited the proposed site. She told us she had gone to the site to do a walk over after a recent rainfall event. She relayed to us she found what she thought was the beginning of a sinkhole along the east side of the site. We discussed some of her findings and she wanted to know what to do. She indicated she was planning to go back and collect a photographic record of the site. Having been involved with sinkhole and collapse events we suggest she keep her distance from the opening. Apparently surface water from the recent rainfall event was draining into a hole in the ground she estimated to be less than 2 feet across. Based upon the approximate location she provided, we reviewed the seismic shot hole map and determined she may be near a potential shot hole location.

There is no karst topography in or around Harper County. Karst is present only in regions of carbonate rocks and evaporates, most common is calcite. There is no mention of karst in the KGS bulletin for Harper County. This is supported in a letter, dated March 12, 2003, to KDHE from the KGS Director and State Geologist.

kk. Since the contamination potential of the seismic shot holes and core holes as not been evaluated this application should be denied.

The contamination potential of the borings have been evaluated and a plan of action approved in accordance with the February 25, 2005 work plan described in Comment 2gg.

ll. Golder Associates refer to Bayne, 1960 and states 'groundwater flow in the uppermost aquifer near the site is toward the southeast"…"Golder Associates only characterizes the water supply potential for the regional bedrock units. These are Permian Age deposits and the uppermost aquifer clearly and specifically identified by Bayne, 1960 is Quaternary in age. In the exhibits you will find maps we have copied from Bayne, 1960. These maps are enlarged portions of Plate #1 which is the aerial geology map for Harper County (Exhibit 3.2.1.1) and Plate #3 which shows the water table contours and the location of wells and test holes (Exhibit 3.2.1.2). Bayne very explicitly explains the process he used to identify the water table contours he used for Plate #3. We have provided a copy of his test and it is included as Exhibit 3.2.1.3. Bayne tells us he used dashed lines for the inferred water table in the Permian deposits and solid lines for the water table in the Pleistocene deposits. We connected the ends of the solid lines for that portion of the Pleistocene aquifer which crosses the site. We have superimposed Plate #3 over Plate #1 and the boundaries of the Pleistocene aquifer water table contours match very well to the Pleistocene deposits. See Exhibits 2.3.1.4. Based on this data the uppermost aquifer at this site is saturated Pleistocene deposits. Golder Associates appears to have ignored this portion of Bayne's report.

Waste Connections did not ignore the KGS Bulletin, but used it as a basis for the site-specific investigation which determined that the overburden is discontinuous and that the uppermost aquifer is in bedrock.

mm. *Bayne's mapping of the Pleistocene aquifer and its relationship to the seeps and springs identified by MEC and the fact Golder Associates has demonstrated wells installed into the Pleistocene deposits adequately meet the aquifer definition set forth by KDHE.*

The overburden can meet the definition of an aquifer; however, the overburden is proposed to remain only in the "panhandle" northwest portion of the landfill footprint. All other areas of the footprint will have the overburden completely removed and therefore can not provide a conduit for contaminant flow. See Comment 2z.

nn. Since the uppermost Pleistocene aquifer does not appear to be delineated or adequately monitored the application should be denied.

See Comment 2mm.

oo. Golder Associates identified 18 wells within 2.5 miles of the Plum Thicket site and are shown on Figure III-5. One of the wells was identified as not being drilled on the Plum Thicket property but its actual location was not verified. Until the actual location of this well is

verified it should remain on the list. It is possible the well is still located within 2.5 miles of the site.

The actual location of this well does not unduly impede the ability of Waste Connections to construct or monitor the proposed landfill and cannot be identified based on documentation error not caused by Waste Connections or its consultant.

pp. *We have modified Figure III-5 to include four other readily identified domestic wells. See Exhibit 3.2.2.1. One is located on the private property in the SW corner of section 4 of the Plum thicket property; the second is approximately 2.0 miles east of the SE corner of the Plum Thicket property; the third is 0.5 miles east and approximately 1.75 south of the SE corner of Plum Thicket property (From Bayne, 1960). The other is approximately 1.5 miles due east and across the road north of the NE corner of the Plum Thicket property (From Lane, 1960). These additional wells bring the potential number of wells up to 22. The fact these wells are not part of the, KGS or DWR, databases does not mean they are not there. We currently have or had several projects where we are utilizing similar wells. The wells from Bayne, 1960 are plotted on Plate 3 and Lane, 1960 plotted the wells in Kingman County on Plate 3 of his report. Even though Golder Associates did not use the water table maps the wells are still shown in the well and test hole records associated with their respective County Bulletin. It appears there may be several wells in this area that have yet to be identified. Does the applicant plan to do that?*

The well shown on the site is not in use; the other wells depicted in Exhibit 3.2.2.1 are either cross-gradient of the site or are immediately downgradient of other off-site water wells. There is no indication that those wells found in 1960 remain in use.

qq. *Golder Associates provides limited water quality for the "overburden" aquifer so, does this mean there is a Pleistocene aquifer?*

See Comments 2c & 2z.

rr. *Golder Associates states: 'At most locations, a zone of completely weathered bedrock separated the overburden from the more consolidated bedrock. The thickness of the completely weathered bedrock was typically 2 feet or less.' The 2 foot description does not appear to be consistent with the descriptions in the bore hole logs.*

The boring logs provided detailed descriptions of the weathered bedrock encountered during drilling. The two-foot or less description is appropriate.

ss. *Golder Associates has identified the presence of a weathered bedrock aquifer and an underlying consolidated bedrock aquifer. They do not correlate those stratigraphic units on their hydrogeologic profiles.*

The weathered bedrock need not be described in a generalized cross-section. Figure III-16 shows the thickness of weathered bedrock found in wells at the site. The bedrock weathers to clay and is not considered an "aquifer".

tt. Since the proposed landfill design shows the landfill transecting through all or part of two of the aquifers at this site the application should not be approved.

See Comments 2x & 2z.

uu. Golder Associates makes many assertions in the 4.2.x.x. sections under the general heading of Hydrogeologic Conditions regarding the "overburden materials" at this site. It is important that the "overburden" be correctly identified as Bayne, 1960 described it. Bayne described these deposits as undifferentiated Quaternary deposits of silt, sand gravel and volcanic ash in upland position. Which yield moderate to large supplies of water to wells. According to Lane, 1960 this area is hydrogeologically connected to the Quaternary deposits in Kingman County. Land identifies the uppermost aquifer as the Fullerton and Holdrege Formations which are Pleistocene deposits. Specifically he says they are composed of silt, clay, sand, gravel, and some caliche which can yield moderate to large water supplies where saturated thickness is sufficient. Therefore, and more specifically, the "overburden" as referred to by Golder Associates is actually a Pleistocene aquifer. See Exhibits 4.2.1 and 4.2.2. Since it appears Golder Associates has not evaluated the relevant data from Kingman County the application should be denied.

See Comments 2c & 2z.

vv. Golder Associates starts this section (Section 4.2.1) by stating: 'Although perched groundwater is locally present within the overburden materials (Figure III-21), these areas of perched groundwater are not laterally continuous across the site.' This is a true statement and misleading, especially when the data indicates there is more continuity than discontinuity in the ground water system. Whether this Pleistocene aquifer is laterally continuous over the entire site is irrelevant. What is relevant is the fact the Pleistocene aquifer is present over a large portion of the footprint for the proposed landfill. This is especially relevant when perched ground water is required to be evaluated. Based upon the data from Golder Associates there appear to be two ground water zones associated with this Pleistocene aquifer.

See Comments 2c & 2z.

ww. The next statement Golder Associates makes is: 'At the 36 locations investigated within and near the proposed landfill footprint, the overburden was dry at 19 locations.' For the most part this appears to be a true statement. In some aspects, Golder Associates statement is very misleading and irrelevant. Some of the locations appear to be hydrogeologically remote and/or are not hydraulically connected to the site except where ground water leaves the Pleistocene aquifer through seeps and springs. Bayne, 1960 indicates discharge from springs and seeps either evaporates, is taken up by plants or travels over the Permian

bedrock and re-enters the permeable materials over the ground water reservoirs in the area. The relevant part of the data Golder Associates submitted indicates there are several drilling locations which exhibit shallow ground water associated with the Pleistocene aquifer. Several are within the footprint of the proposed landfill and/or hydraulically connected to that portion covered by the proposed landfill footprint. In addition, many of the borehole locations which indicate shallow ground water are in close proximity to the known seeps and springs at the site. This in itself indicates there is some continuity to the Pleistocene aquifer. To automatically dismiss a potential aquifer based on 50% of the holes not having water present appears to be inappropriate. Since the readily apparent uppermost aquifer at this site will have landfill cells transecting its water table the application should be denied.

See Comments 2c & 2z.

xx. Golder Associates next statement appears to refer to the ground water recharge component of the Pleistocene aquifer for this site. They say: 'Topographically high areas in the western portion of the proposed landfill footprint area are a source of recharge for the perched groundwater zones that are locally present.' This statement is true, misleading but true. The topographically high areas contribute recharge to the area as well as all of the other areas that are overlain with Pleistocene deposits. According to Bayne, 1960, the main component of recharge in Harper County is precipitation. Since much of the proposed landfill area is covered by Pleistocene deposits, recharge can occur any where these deposits are present.

Once the liner and landfill cap have been completed, the surface water will be diverted from the area to avoid infiltration through the landfill. See Comment 2c.

aaa. In addition Bayne indicates there is potential recharge onto the site from Kingman County. The work done by Lane, 1960 indicates there is a potential for ground water to be discharged from the proposed landfill site towards the North into Kingman County. This may seem confusing but as Bayne states there is a ground water divide along the Harper-Kingman County line. This groundwater divide appears to encompass the northern edge of this site. The effects of this ground water divide phenomenon is illustrated it two separate exhibits. Exhibit 4.1.1.1 is a composite water table map and is the result of joining the Kingman County data from Lane, 1960 and the Harper County data from Bayne, 1960. As you can see the water table contours match up fairly well and indicate there is the potential for ground water to enter the site from Kingman County. Additionally, it also demonstrates the potential for ground water to leave the site and enter Kingman County. The potential for ground water to leave Harper County and move into Kingman County is also illustrated in the south end of Cross Section D-D' from Lane, 1960. See Exhibit 4.2.1.2 A portion of this trace for Cross Section D-D' is illustrated on Exhibit 4.2.1.1 This trace starts at the NW corner of the Plum Thicket property and runs North through Kingman County. Since the applicant cannot provide the data to refute the work done by Bayne and Lane the application should be denied.

Waste Connections has adequately determined that bedrock groundwater flow at the site is to the southeast. The author states that overburden groundwater flows north from the site and

south to the site and across a groundwater divide. The "exhibits" provided support the groundwater divide to the north of the site by showing the southeastern flow from the site and the northeastern flow to the north of the site in the overburden. There is no indication that groundwater in the overburden at the site could possibly enter or leave Kingman County.

bbb. In several of the statements above, Golder Associates dismisses the importance of the uppermost aquifer at this site as being dry in some locations, laterally discontinuous across the site and recharged from the topographically high areas in the western portion of the proposed landfill foot print. If that is the case how does Golder Associates explain that ground water from the recharge area, on the west side of the proposed landfill footprint, get to the seeps and springs on the east side of the proposed landfill footprint?

See Comments 2c & 2z.

ccc. Golder Associates appears to be concerned with the confined aquifer conditions found in a portion of the bedrock Permian aquifer. They state: 'In portions of the site, groundwater was encountered under confined conditions within the bedrock, particularly in the northwestern portion of the proposed footprint. This was evidenced by excess hydraulic head being measured in various borings.' Specifically they refer to MW-14, which exhibited '. . . 15 feet of excess hydraulic head measured relative to the depth where groundwater was initially encountered in the bedrock.' The fact there are confined aquifers found in the Permian Redbeds is not unusual in Kansas, especially when Bayne, 1960 identified a flowing test hole for an oil exploration survey and is identified as well 34-5-32abb in Table 10. He also tells us there are other wells in the area which do not flow but are believed to obtain water from the same zone. The flowing well identified by Bayne is quite remote from this site but is an indicator of potential artesian conditions in the Permian bedrock aquifers.

No well at the proposed site freely flows to the surface.

ddd. What is not known is the cause for the 'excess hydraulic head'. Based upon the data submitted by Golder Associates there is more than one potential source for the artesian conditions. MW-14 appears to be situated near one seismic shot hole #521 and is illustrated in Exhibit 2.2.2 Golder Associates has not proven the shot holes are not acting as conduits for downward migration of surface water and/or ground water from the uppermost Pleistocene aquifer. There have been many documented situations in Kansas where seismic shot holes have been responsible for commingling ground water aquifers and surface water, both up hole and down hole. In addition, MW-14 is very near an old core hole identified on the seismic shot hole map they provided. A more readable copy of the map was readily obtained and we have submitted it as Exhibit 2.2.3. The data indicates the core hole was drilled to the base of the Permian Wellington Formation. Having worked with monitoring well networks completed in the Permian and several flowing core holes we have seen the Permian exhibit artesian conditions of 100 plus feet of total head.

The shot holes will be evaluated and grouted as overburden is removed. Special permit conditions require a demonstration that proper vertical separation from the uppermost aquifer

is maintained where the overburden remains in the northwestern panhandle of the landfill footprint. See Comment 2gg.

eee. Golder Associates refers the hydraulic conductivity of the bedrock units as being very low and state: 'Beneath much of the site, little or no water was encountered when drilling through the bedrock hydrostratigraphic unit, which is a further indication of the low transmissivity of this stratum.' Bayne 1960, tells us there are areas that will yield sufficient quantity and quality ground water than can be used for domestic and livestock purposes. Golder Associates quote above indicates the bedrock hydrostratigraphic units in this area would be a poor aquifer. Golder Associates assumption that the bedrock hydrostratigraphic units are poor aquifers is not consistent with some of the data they submitted. As discussed above we show there are four additional wells readily identified within 2.5 miles for the proposed site. Of the 22 wells identified, by Golder Associates, Bayne and Lane, 10 are Permian bedrock wells. Seven are sand and gravel wells completed in the Pleistocene aquifer. The remaining 5 wells appear to be multiple aquifer wells that have the potential for producing water from the upper sand and gravel aquifer and/or the upper Permian bedrock aquifer. Therefore, it appears 45% of the wells identified for this area produce ground water from the Permian bedrock aquifer(s). The domestic well forms submitted by Golder Associates indicate production yields from the Permian ranges from just a few gallons per minute to as much as 60 gpm. This data suggests the Permian Redbeds can be a rather prolific aquifer.

Bayne summarized the Harper County geology and did not study the proposed landfill site in detail. The productive wells in the area are completed in different geologic formations.

fff. Based upon our review of the construction details for the monitoring wells and piezometers we noticed a very fine slotted (0.010) screen was used in conjunction with 10-20 filter pack. It is not unusual for this combination of fine slotted screen and fine gravel pack to be used for monitoring wells, however; their use in a typical production well is extremely limited. It has been our experience that using 0.010 slotted screens is not conducive to efficient well development. This is especially true if there is borehole damage caused by the drilling process. Smearing of the borehole annulus and or plugging of secondary porosity features due to core losses and lost circulation are the major problems encountered. These situations cannot be removed or effectively reduced if you cannot move sufficient water through the screen and/or the gravel pack intervals. It appears some of reduce hydraulic conductivity values identified by Golder Associates may be well design related.

All wells were installed and developed in accordance with current practices and are typically useful for the slug testing performed. Waste Connections has adequately demonstrated, through well development procedures and subsequent groundwater sampling events and total depth measurements, that the wells were properly developed.

ggg. In reference to the unconsolidated materials above the bedrock Golder Associates states: 'Therefore, it would be inappropriate to present a potentiometric surface map of the perched groundwater, or to present hydraulic gradients for these discontinuous saturated zones.'

Unless Golder Associates can demonstrate the inappropriateness of not mapping the uppermost Pleistocene aquifer it is inappropriate to automatically dismiss the potential importance of the uppermost aquifer at this site. Apparently it did not bother Bayne, 1960 or Lane, 1960 to map the uppermost aquifer at this site or the surrounding area.

Waste Connections has adequately demonstrated that, at the proposed landfill site, the overburden is discontinuous. As Bayne (1960) demonstrated, the overburden aquifer pinches out within the proposed landfill footprint. Therefore, the bedrock aquifer poses the greatest potential for migration of contaminants from the proposed site. See Comments 2c & 2z.

hhh. Using the data from the logs, measured water levels and the MEC study submitted by the applicant we simply contoured the uppermost Pleistocene aquifer for this site. Exhibit 4.2.2.1 is a copy of Drawing 2 submitted by the applicant. This map shows the water table contours for the main portion of the uppermost aquifer at this site. The water level data plotted was obtained from the drill logs with the exceptions were we show a water level from that respective piezometers. We selected the highest water level indicated except for the three piezometers which exhibit perched water in the Pleistocene aquifer. This data is summarized in Exhibit 4.2.2.2. Although we did not show the perched water on Exhibit 4.2.2.1 it would be inappropriate to ignore the potential impacts of the perched ground water zones. As you can see the flow regimes present at this site correlate with the site topography and the seeps and springs mapped by MEC. What this map illustrates is that ground water moves from the ground water highs in the aquifer towards areas of discharge (i.e. seeps and springs). Based on this data it appears the uppermost Pleistocene aquifer contributes significant amounts of ground water to Pond 1. Additionally it also illustrates the potential for variable ground water flows onto and away from the site just as Bayne and Lane indicated. The water table map we submitted indicates the uppermost aquifer at this site extends into the southern portion of the proposed landfill area and may be encountered during excavation of Area A. It appears much of the Area B excavation will encounter the shallow aquifer. With additional work the uppermost Pleistocene aquifer at this site can be better delineated and evaluated. This additional information can then be used to better analyze the ground water – surface water interaction at the site. Until the uppermost aquifer is delineated and evaluated this application should be denied. It appears Golder Associates has taken the position that if they did not map it is not important or relevant.

Since the overburden is discontinuous and will be excavated from most of the proposed landfill footprint and all of the downgradient end of the proposed footprint, the bedrock aquifer is the most likely media for contaminant migration. Therefore, during construction of the landfill, the overburden aquifer will be removed and the water captured and diverted to the surface. See Comments 2c & 2z.

iii. Since the applicant does not provide the data which shows the uppermost aquifer at this site is adequately monitored, mapped, the boundaries defined and the potential impacts evaluated this application should be denied. At this time there has been no data presented by the applicant to demonstrate the uppermost aquifer, which covers a significant portion of the proposed landfill footprint, is not a Pleistocene aquifer.

Waste Connections has provided adequate data to prove the uppermost aquifer is in bedrock and that the overburden is discontinuous. See Comments 2c & 2z.

jjj. The only documentation regarding piezometers and well development was found in Table III-4. This table summarizes the amount of water removed from the wells or piezometers. The maximum water removed from an one well appears to be 65 gallons. Without better documentation regarding the type of development methods used and the amount of sediment removed there is nothing in the report that even suggests the wells are completely developed. Unless it can be determined the wells and piezometers are completely developed and have good hydraulic connection to the formation the slug tests and packer tests may not be representative.

Waste Connections has provided information in Table III-4 that adequate volumes of water were removed from the wells for development. Given the low permeability of the bedrock wells, slow recharge and purging of these wells is expected.

kkk. Based on several of the logs from Golder Associates drilling program and the seismic shot hole data there are several areas in and around this site which have lost circulation zones present in the Permian bedrock formations. Some of the data indicates drilling fluids and cores were lost to lost circulation zones. It is not possible to lose circulation down hole unless there is some place for it to go. To lose the amount of drilling fluids present in the boreholes and not regain circulation indicates there are some zones in the bedrock which have high transmissivity values.

In the two bedrock boreholes with lost circulation, the loss of circulation in BH-3 was above the first water encountered (i.e., in air-filled fractures). For both BH-3 and BH-2, drilling continued (even after first water was encountered) to install a well that could be purged and provide a representative sample for analysis. The tight bedrock formation will not provide enough water for sampling if there are not enough fractures screened. In fact, the screened areas are, by virtue of the amount of fracturing, the zones of potential increased permeability. See Comment 2x.

lll. It has been our experience that well construction techniques and materials can have a direct impact on aquifer tests. The screen slot size (0.010 in) tends to limit the surging energy needed for proper well development. In addition, the introduction of fine sand filter pack into the fractures associated with the lost circulation zones tend to facilitate the plugging off of the formation. With proper well design and development a monitoring well at this site may exhibit similar aquifer characteristics as seen in the domestic wells completed in the area.

Waste Connections has adequately demonstrated, through development procedures and subsequent groundwater sampling events, that the wells were properly designed and developed.

mmm. We find it interesting with all the boreholes which exhibited lost circulation problems it appears none of them were used for the packer test. Why is that?

Aquifer testing was performed only at wells with adequate water volumes. See Comment 2kkk.

nnn. Golder Associates discussion of the test results includes this statement: 'In some of the cases, the hydraulic test data were influenced by formation damage near the boreholes which resulted from drilling.' As discussed above it is our opinion the lack of development, borehole damage and well design may have significant impacts on the test data. Golder indicates they recognize the data from some of the sites may be influenced but they do not identify those sites. Nor does the applicant indicate how they plan to collect representative data. Additionally Golder Associates states: "A composite flow model was used for analysis of the data because it allowed for the determination of formation transmissivity outside the influence of the damaged zone (i.e., outer-zone transmissivity)."

The standard disclaimer regarding formation damage during drilling explains initial results during the aquifer test. This is a common problem with the analysis of the test results which must be considered and was considered.

ooo. The composite flow model appears to be identified but the raw data is not provided. There appear to be several types of data plots presented in Appendix III-D but there is no discussion why the different plots are used. How was the composite flow model calibrated to this site? It appears Golder Associates used two types of in-situ tests on the monitoring wells and the piezometers, neither of which requires large quantities of water to be withdrawn. Additionally, there does not appear to be any way to verify the transmissivity results. Since it appears the aquifer test data was not submitted and it cannot be verified this application should not be approved.

The required data is included in Appendix III-D. The description of the testing and analysis is included in Section 3.7 of Appendix III-A.

ppp. The low permeability aspects of the Permian bedrock as described by Golder has not been verified nor is it consistent with typical production rates from the domestic wells in the area.

The permeability of the bedrock has been adequately investigated and characterized. Productive wells in the area are screened in different geologic formations and are not applicable to the proposed Plumb Thicket site.

qqq. The overburden materials referred to above occurs over a significant portion of the site and satisfies the aquifer definition. It was an aquifer in 1960 as well as today. They further state: "Because the overburden is dry beneath significant portions of the site, the uppermost, laterally continuous groundwater flow zone exists within the relatively competent, Permian bedrock hydrostratigraphic unit." Golder Associates has not demonstrated what

"significant portions of the site" consists of. The Administrative Regulations definition of an "Aquifer" does not have the term "laterally continuous" in it.

Figure III-16 shows the discontinuity of the overburden. Since the overburden is discontinuous and will be excavated from most of the proposed landfill footprint and all of the downgradient end of the proposed footprint, the bedrock aquifer is the most likely media for contaminant migration. Therefore, during construction of the landfill, the overburden aquifer will be removed and the water will be captured and diverted to the surface. See Comments 2c & 2z.

rrr. Both Bayne and Lane discuss temporal variations in the water tables due to climatic conditions. It is possible the unsaturated portions of the uppermost Pleistocene aquifer will become saturated during wet times. Either way, wet or dry, contaminants can be transported through the Pleistocene materials.

See Comments 2c & 2z.

sss. Until an adequate monitoring program is developed to prove otherwise the uppermost aquifer, at this site, is composed of the Quaternary deposits as described by Bayne, 1960 and Lane, 1960.

Waste Connections has adequately demonstrated that the uppermost aquifer is in the bedrock. See Comments 2c & 2z.

ttt. With regards to separation distances Golder Associates states: "In addition, based on depths that groundwater was first encountered within the bedrock hydrostratigraphic unit, there will be at least 5 feet of separation between the groundwater and the landfill subgrade, in accordance with KDHE requirements." This statement is inaccurate and misleading. To be 'in accordance with KDHE requirements" the uppermost aquifer at this site has to be identified. It appears this requirement has not been satisfied by Golder Associates. The uppermost aquifer at this site, as defined by KDHE, is the Pleistocene aquifer. Any aforementioned or subsequent referral to the uppermost aquifer at this site being the Permian bedrock hydrostratigraphic unit appears to be inaccurate and misleading. The only place the uppermost aquifer is the Permian bedrock is where there is proof the Pleistocene aquifer does not exist. The statement above by Golder Associates has been carried over onto Figure 1-3. This figure is labeled as an "ISOPACH MAP OF THE SEPARATION BETWEEN THE GROUNDWATER AND THE SUBGRADE." Golder Associates states on this map the following "GROUNDWATER ELEVATIONS USED TO CREATE THIS MAP REPRESENT THE ELEVATIONS AT WHICH GROUNDWATER WAS FIRST ENCOUNTERED DURING THE DRILLING." As discussed above this is an inaccurate and misleading statement. Based on the data submitted by Golder Associates ground water will not only be within 5 feet of the proposed landfill subgrade but will, in places, be up the side of the proposed liner system. This is illustrated in Exhibit 4.2.6.1 which is a copy of a portion of Cross Section C-C' from Golder Associates Drawing 14. The partial trace for C'-C is shown on Exhibit 4.2.2.1 and is situated between Pz-12s&d and Pz-13. Cross Section C-

C' depicts the configuration of the excavated landfill subgrade and liner system and their relationship to the remaining Pleistocene aquifer.

See Comment 2z.

uuu. It is extremely important everyone understands that not all of the uppermost Pleistocene aquifer (overburden) will be removed from the entire site. There are many places the uppermost aquifer will remain in place and directly adjacent to the proposed landfill cells. Based on the water level data submitted by the applicant there will be ground water present in the uppermost aquifer that will be transected by the landfill subgrade. Since it appears the separation distances cannot be met the application should be denied.

See Comment 2z.

vvv. With regards to the ability of the bedrock formations to transmit water Golder Associates states: 'This is consistent with hydraulic test results and regional information (Bayne 1960) indicating that water supplied by many bedrock wells installed in the area are inadequate for domestic or stock use.' It appears Golder Associates misquotes Bayne again, and this statement is not consistent with the local domestic water well data they submitted.

The KGS information was correctly stated. See Comment 2c.

www. Golder associates addresses the historical data again and states: "Hydrogeologic information collected at the Plumb Thicket site indicate that the historic seismic investigation described in Section 2.2 have not significantly impacted the ability of the siltstone to function as an aquitard." This appears to be a misleading statement by Golder Associates. They have not provided any information which demonstrates the seismic shot holes are not impacting the site. Specifically they have not provided the data that even suggests they attempted to locate one of the shot holes.

See Comments 2z & 2gg.

xxx. When Golder Associates says "…if seismic survey holes are present within the facility subgrade during landfill excavation operations, these holes will be overdrilled and grouted to provide a further environmental safeguard for the facility." It appears they are not convinced the seismic shot holes even exist. If they received all the seismic data they should have the surveyor's data also. Unless the shot holes are investigated the actual impacts on this site are unknown. This would also be true for any of the core holes found at the site.

See Comment 2gg.

yyy. In (Section 7.0) Mr. March (Golder) states: "Piezometers and groundwater monitoring wells were established to determine the direction and flow characteristics of the groundwater in all strata, extending down to the bottom of the uppermost aquifer." This does not appear to be an accurate statement. The data submitted by Golder Associates indicates the upper

most aquifer has been ignored. "The vertical extent of the uppermost aquifer, and the direction and rate of groundwater flow, and the confining unit were determined." This does not appear to be an accurate statement. The data submitted by Golder Associates concentrates on the Permian aquifers. It appears the uppermost Pleistocene aquifer at this site has been summarily dismissed and ignored. Based on these two apparently inaccurate statements the application should be denied.

Neither the uppermost bedrock aquifer nor the discontinuous overburden perched water zones were ignored in the hydrogeologic investigations.

Since the overburden is discontinuous and will be excavated from most of the proposed landfill footprint and all of the downgradient end of the proposed footprint, the bedrock aquifer is the most likely media for contaminant migration. Therefore, during construction of the landfill, the overburden aquifer will be removed and the water captured and diverted to the surface. See Comments 2c & 2z.

3. <u>Types of waste that could be accepted</u>

a. Your position is that all waste will be harmless household waste, but in reality, you run TV spots trying to convince people to stop putting hazardous material in the trash.

Not all waste is "harmless" or generated by households. However, state statutes and regulations prohibit disposal of concentrated polychlorinated biphenyls (PCBs), vehicle batteries, waste oil, bulk liquid waste, and large quantities of hazardous waste into this type of landfill.

Small quantities of hazardous waste from households and some businesses are allowed in municipal solid waste landfills. However, it is widely recognized that those types of waste (solvents, cleaning fluids, etc.) may pose safety concerns to landfill workers, may increase the cost of leachate management, and may present significant threats to human health and the environment in the unlikely event of a release. Therefore, KDHE promotes responsible diversion of these wastes to household hazardous waste collection facilities where the products can be properly stored, bulked as appropriate, re-sold or given away for use, and transported to permitted hazardous waste disposal facilities.

b. The operators of the landfill cannot assure the citizens of any control over hazardous material either in quality or quantity that may be dumped in the landfill. These substances would include benzene used in the making of plastic containers, toluene, and xylene-based products used for cleaning parts, all of which would be dumped on the ground with the likelihood of percolating into the groundwater as has been shown through past landfill experiences.

Several mechanisms are used to prevent improper disposal of hazardous waste. First of all, businesses that generate hazardous waste are required to register with the state and are periodically inspected to ensure that they manage their waste streams appropriately. Most

businesses that generate hazardous waste either recycle the materials in their processes or have a contract for proper disposal at permitted hazardous waste treatment, storage, and disposal facilities.

Secondly, landfill operators regularly "screen" incoming waste to ensure that prohibited waste types (such as benzene, toluene, and xylene) are not disposed in the landfill. This is usually accomplished through random and targeted load inspections. Bulk quantities of liquids, such as the compounds you listed, would immediately catch the attention of landfill staff. They are trained to identify and prevent disposal of illicit wastes in the landfill. It is in the landfill operator's best interest to avoid disposal of illicit wastes, because they will get fined or may lose their permit if KDHE finds illegal waste in the landfill and the presence of such waste may increase the risk of groundwater contamination which they would be responsible for correcting.

Finally, KDHE staff regularly inspect landfills and check that only acceptable waste is being disposed. These inspections do not only include visual observations on the day of the inspection, but also include record reviews. Furthermore, KDHE requires annual leachate sampling that would likely show if illicit wastes of the type you listed were disposed in significant quantities. Another important system being used to reduce the quantity of chemicals coming from the City of Wichita and Sedgwick County is the new and state-of-the art Household Hazardous Waste Collection Facility, management, and operating personnel. Many households and small quantity generators from businesses take their hazardous waste to this facility for reuse and/or disposal. In 2004, 750,000 pounds of household or small quantity generator hazardous waste was diverted from disposal.

In addition, if benzene, toluene, and xylene were somehow disposed into a permitted landfill, they would not be "dumped on the ground". Municipal solid waste landfills, such as this one, have engineering designed and constructed liner and leachate collection systems to prevent liquids from percolating into the ground.

c. *Citizens of Kansas believe the application for this permit is for a municipal solid waste landfill only. Does the permit application allow for toxic hazardous waste to be stored, treated, and/or buried at the site?*

The permit is for a municipal solid waste landfill only. It does not allow hazardous waste storage, treatment, or burial (disposal) at this site, except for temporary storage of small quantities of hazardous waste that may be generated in the operation of the landfill. Any hazardous waste generated by the landfill must be properly disposed at a permitted hazardous waste treatment and/or disposal facility.

Based on the conditional use permit issued by Harper County, in the future the landfill owner may apply for a household hazardous waste (HHW) facility permit and a yard waste composting permit. As with any HHW facility, if one is permitted at this landfill it will have to include safe and secure containment of the waste.

d. There needs to be a number assigned to the radiation detector for parts per million. There are many, many radioactive wastes that come out of hospitals or even just from normal everyday life. People don't realize that there are small trace amounts of radiation that can affect polymers. Also, these radioactive wastes are not the only contaminants that must be worried about. There are heavy metal ions that come out of batteries and paint.

Radioactive waste from industries and hospitals is not allowed to be disposed in municipal solid waste landfills because those facilities are not licensed to receive that type of waste. In fact, there are no licensed radioactive waste disposal sites in Kansas. Hospitals and industries generally use the decay-in-storage method or disposal in a sanitary sewer system. For decay-in-storage they are required to hold the waste for at least 10 half-lives then survey it and if it is not distinguishable from background radioactivity then it may be disposed in a landfill. For disposal in the sewer system the waste must be soluble in water and the concentration averaged over a month cannot exceed certain levels based on each radionuclide. The only other options are to send it to a licensed disposal site outside the state.

Disposal of very low-level radioactive waste from other sources, such as that found in household smoke detectors, is routinely allowed in municipal solid waste landfills and has not been found to increase risks to human health or the environment. Radiation detectors are not required at landfills, but some owners opt to install them to identify and prohibit disposal of wastes with higher radiation levels, such as those sometimes associated with gas and oil well drillings.

Heavy metals are commonly found in all municipal solid waste leachate. Landfill liners are resistant to damage from these constituents, and the metals are either sequestered in the landfill through leachate recirculation or evaporation, or metals are removed when the leachate is disposed in wastewater treatment facilities.

4. <u>Compliance History and Character of Waste Connections</u>

a. You also try to convince us that Waste Connections are a responsible company, with a foolproof plan. My experience with them is, a very uncaring company, with no regards for the general publics safety.

KDHE has not tried to convince anyone about whether Waste Connections is a responsible company, and KDHE would not characterize any plan as “foolproof”. KDHE performed a background check on Waste Connections, as it does on all permit applicants, and did not find substantial reasons to reject their application. The compliance history at Waste Connections facilities in Kansas and other states is generally acceptable.

b. [Referring to Article VIII in the host agreement, in which Waste Connections is not obligated to extend the benefit of its Fair Market Value property guarantee to adjacent property owners who challenge the permit issuance, etc.] Is this a bribe or threat to keep landowner quiet?

The host agreement was negotiated between Harper County and Waste Connections. KDHE was not involved in those negotiations, although it did advise Harper County on certain conditions of the agreement. KDHE refrains from judging the intent of Waste Connections in this matter.

c. *Can KDHE and the public trust licensed professionals hired by Waste Connections?*

KDHE and the public rely on the licensing authority of the Kansas State Board of Technical Professions. Waste Connections and their consultants could be prosecuted if they submitted false or fictitious data.

d. *[Referring to violations at Red Carpet Landfill in Oklahoma] Why should WCI, Inc. be allowed in the State of Kansas with another landfill when they do not follow rules / regulations -- no matter how small of a rule we think it might be?*

Landfills must comply with hundreds of requirements. Weather and other events beyond the operator's control make compliance more difficult still.

Typically, inspectors issue a notice of noncompliance when violations are observed, including deadlines for the landfill operator to correct the problems. Failure to promptly correct problems, or gross negligence, may result in fines or other penalties including permit revocation.

Given the common occurrence of minor violations at landfills, KDHE does not automatically reject applications from landfill owners with past violations. Instead, the agency considers the number of violations, the types of violations, whether the landfill operator corrected the problems in an appropriate and timely manner, whether significant impacts to human health and the environment occurred, whether significant public nuisances occurred, etc. Using this approach, KDHE has denied some permits. However, KDHE did not find substantial justification to deny this permit.

e. *These trash people move in and get everything built and ready to go before they even get approval, so you know something is not right.*

State law prohibits construction of a landfill prior to permit issuance. However, some associated construction activities common to any type of development, such as clearing, surface grading, and storm water management, are allowed without a landfill permit. Those activities are subject to local government approval and must comply with all pertinent local, state, and federal laws. KDHE inspected the landfill site on several occasions prior to permit issuance and did not find illegal construction of a landfill without a permit.

f. *There is a problem with Waste Connections claiming to be agent for Plumb Thicket Manufacturing, Inc. This corporation did not exist when the Special Use Application was*

submitted to Harper County Zoning Administrator, therefore Waste Connections could not possibly have been - nor are they now - agent for Plumb Thicket Manufacturing, Inc.

The landfill permit application for this site was submitted by Waste Connections of Kansas, Inc. KDHE checked with the Secretary of State's office and found that this was a legal business entity in good standing. KDHE was not involved in the county's special use permit decision, and therefore KDHE is not in a position to answer specific questions about that process.

g. *It appears that by purchasing the 958 acres, Waste Connections will eventually construct a much larger landfill than the proposed 229-acre one, allowing them to bring in trash from many surrounding states. Is this what we want for our area and state?*

As shown on the landfill design plans, most of the 958-acre property will be buffer areas around the landfill. Some of the buffer areas will remain undeveloped, containing natural habitat such as Freeman Canyon Creek and associated wetlands. Some of the buffer areas may continue to be used for agricultural purposes. Some of the buffer areas may be used for storm water holding ponds, soil borrow areas, and other activities to support the landfill operation.

The permit does not allow waste disposal outside the 229-acre footprint. The landfill owner could submit a permit application to expand the landfill footprint; however, that would require another local government approval and another review process by the state, including the opportunity for public input. At this time KDHE is not aware of any intention on the part of the landfill owner to apply for any expansion of the landfill footprint.

With regard to waste imports from other states, this is a legal activity protected by the commerce clause in the U.S. constitution. Kansas is currently a net importer of waste (imports exceed exports), primarily due to imports from Missouri to landfills along the eastern side of Kansas. This is driven by market forces (supply, demand, prices) rather than political positions or public desires.

However, it seems unlikely that Plumb Thicket Landfill would receive any significant quantities of waste from out of state since the Special Use Permit issued by Harper County limits the rate of disposal to 2,000 tons per day.

h. *Who described the geology in the hydrogeologic investigations and how is KDHE sure that there are no mistakes?*

KDHE confirmed the Waste Connections hydrogeologic investigation reports by comparing them to the regional geology literature available, reviewing boring cores, and inspecting the site and trenches within the landfill footprint. The Waste Connections hydrogeologic investigation report was prepared by a professional geologist licensed by the Kansas State Board of Technical Professions (KSBTP) and that report was reviewed by a KDHE/BWM (Bureau of Waste Management) licensed professional geologist. The report was further

reviewed by a panel of KDHE and Kansas Geological Survey (KGS) licensed geologists. The KSBTP grants a geologist license and requires competence, integrity, ethics, and ensures a standard of practice of geology.

i. KDHE should get a second opinion on the hydrogeologic study.

The hydrogeologic investigation was performed by a professional geologist and was reviewed by a series of professional geologists at KDHE and KGS. See notes above regarding licensed geologists.

j. Can Waste Connections falsify well sample results?

If Waste Connections falsifies their results, they would be subject to enforcement action. KDHE will periodically collect split-samples of the downgradient wells and submit the samples to the Kansas Health and Environment Laboratory for confirmation. A KDHE licensed geologist will also peer review all documentation and validate all data received from Waste Connections using sample chain-of-custody forms and other documentation from the state certified analytical laboratory.

k. KDHE should not rely on Waste Connections data.

Waste Connections data came from a number of sources other than their own. Regional hydrogeology information came from the Kansas Geologic Survey (KGS) and the United States Geological Survey (USGS). All of Waste Connections data is reviewed by KDHE licensed geologists and engineers. See notes above regarding the licensing of geologists. KDHE will be on-site during some future groundwater sampling events and will collect duplicate quality assurance / quality control samples.

5. <u>Traffic safety and related concerns</u>

a. I meet a lot of trucks at night when I come home from work, but since Waste Connections started coming out this direction we have one person killed, we have several accidents where they rolled the trucks. Statistics indicate that it is probably going to become worse.

Like all companies with truck fleets, Waste Connections must follow all relevant laws and safety practices. If you have specific allegations of any trucking violations, you may report those to the appropriate law enforcement agencies.

KDHE requested input from KDOT about the truck safety concern that you raised. KDOT replied that some traffic flow improvements would be required on Highway K-2.

b. During the August 2000 hearings, concerned citizens told the Joint Cities Planning Commission that the rural highways in this area were not designed for the heavy truck traffic that a landfill would bring. This is a Caldwell, Kansas newspaper article showing a Waste Connections truck spilling a load of waste onto the highway. Where will KDHE be when it comes to protecting people from this kind of disaster? The next newspaper article is from the

Clearwater, Kansas High School. The front-page article explains the loss of junior student TJ Madl. TJ was on his way to school February 7, 2003. His vehicle collided with a semi-truck hauling Waste Connections trash to the Meno, Oklahoma landfill. TJ was killed in this collision. Where was KDHE to prevent the loss of this life?

KDHE requested input from KDOT about the truck safety concern that you raised. KDOT replied that some geometric improvements would be required on Highway K-2.

With regard to waste spillage, state regulations require all vehicles used for collection and transportation of solid waste to be designed, constructed, maintained, and operated in a manner to prevent releases of waste. The waste release you described may have been accidental. If you or anyone else witnesses any violations of state solid waste management laws and regulations, you may contact KDHE to report the incident and the agency will follow-up as appropriate.

With regard to the collision you described, KDHE shares your concern and sadness over the loss of life. KDHE has not investigated the cause of the accident, as that is the responsibility of local or state police.

Your comment indicates that the truck involved was hauling waste to a landfill in Meno, Oklahoma. With the new landfill permitted in Harper County, it is anticipated that waste transfer trailers will have a much shorter hauling route to and from Wichita, and that the number of Waste Connections transfer trailers routed to Oklahoma will decrease significantly.

c. *The transfer station that is right up by Vulcan Chemicals, the roads up there are already being beat up and they are disintegrating and Waste Connections says, well, that is not our problem it is the state's problem. They need to fix the road. They are the ones causing the problems with the road. I mean, are they going to tear up K-2 and nobody is going to fix it?*

The transfer station near Vulcan Chemicals is not owned or operated by Waste Connections. Maintenance of public roads and highways is the responsibility of local and state government. KDHE requested input from KDOT about the pavement maintenance concern that you raised. KDOT replied that it is difficult to predict if the additional trucks will affect the pavement, but severe problems are not anticipated.

6. <u>Allegations of financial incentives for state issuance of permit</u>

a. *I only hope that the possibility that KDHE may collect a half million dollars a year in dumping fees doesn't cloud your judgment.*

KDHE collects $1 per ton on non-exempt solid waste disposed in Kansas landfills or transferred out of state. Therefore, there is no difference in the fees collected if Waste Connections continues transferring waste to Oklahoma or if they dispose it in a Kansas

landfill. Incidentally, the tonnage fees are used to fund regulatory oversight, education and outreach, and waste reduction grants by KDHE.

b. *Many are suspicious of KDHE because there is a conflict of interest with tipping fees and incomes for fines levied against landfill companies that goes into the coffers of KDHE.*

Tipping fees are what landfills and transfer stations charge their customers. Tonnage fees are the $1 per ton fee collected by KDHE. As noted in the previous response, there is no difference in the fees whether waste is disposed in state or out of state. Also, fines levied against landfills or other facilities do not benefit the Bureau of Waste Management, which orders that the fines be paid. Collected fines are deposited into a fund (State Water Plan) that is shared by several agencies to protect the water resources of Kansas. Therefore, there is no basis for the alleged conflict of interest that you described.

c. *Mr. Bider said up there at the school that you had to give the trash people the permit. Well, since you more than likely got paid for a license 'bribe' I don't know why you bothered to have the meeting at the school. I could tell by listening everyone was wasting their time to convince you guys in the 'rivers' side to do the right thing.*

KDHE is required by state law to issue a landfill permit if an applicant meets all of the statutory and regulatory requirements. KDHE rigorously examines each application and does not issue a permit unless or until all the requirements are met.

The application fee for this permit was $5,000. That is significantly less than the fees in most other states.

At the public hearing KDHE staff explained that the application had been reviewed and was found to conform to state statutes and regulations. However, a final decision had not been made to issue the permit, pending an opportunity for the public to present information that could potentially identify additional issues to be considered.

In order for public comments to affect a landfill permit decision, the comments must provide a basis for KDHE to determine that the application does not conform to the statutes and regulations. That did not occur in this case.

KDHE carefully recorded all public comments and considered them extensively before making a decision to issue this permit. In order to provide an additional opportunity for public comment prior to its review of future permit applications, KDHE has adopted a new practice of holding public participation meetings when landfill permit applications are received.

d. *On March 6th in Topeka there was a meeting up there with Bill McCreary and Bob Courtney was at the meeting. He was the chairman for the county commissioners of Sumner County and he said he wanted to go on record as saying that he was involved in a telephone*

conference where Bill Bider of KDHE said a landfill could be built anywhere in Kansas, as long as you had enough money. To me that was very disturbing.

The quote attributed to KDHE was misstated and taken out of context. The point is that there are very few locations where a landfill is strictly prohibited. In many locations landfills could be designed and constructed in conformance with the state rules, but some sites would cost more to design and construct than others.

7. Challenges to the local government's zoning process

a. *Until the court case of TCCCI is heard and ruled on there should be no determination by KDHE.*

In July 2003 a district court ruled that the local zoning decision was improper. In response, the Secretary of KDHE directed staff to halt the permit application review process. It remained on hold until December 2004, when the Kansas Supreme Court overruled the lower court's decision.

b. *When the Harper County Zoning Committee had the hearings and voted on the zoning area it was voted down 5 to 0. Then the three County Commissioners ignored these people and voted 3 to 0 to let it pass.*

KDHE was not involved in the local zoning decision, aside from answering questions from the county regarding the state's permit process. A December 2004 ruling by the Kansas Supreme Court upheld the zoning decision by the county commissioners.

8. Possible Environmental Impacts

a. *Aerial photos were not included in the permit application.*

Aerial photos are not required for a landfill permit application. KDHE staff reviewed numerous maps and data sources in their review of this application.

b. *The overburden material is unstable.*

Most overburden will be removed, and the landfill will be located over solid bedrock. Stability analyses show that the underlying materials will support the landfill.

c. *Karst topography is evident at the site (pictures provided: seeps and springs from overburden, side of creek shown as "sinkhole", surface drainage from spring shown as "sinking stream", weathered cliff face shown as "cave").*

See Comment 2jj.

d. There are vertical fractures in the bedrock (pictures provided: rain runoff from weathered cliff face shown as bedrock flow through vertical fractures, weathered cliff face shown as vertical fracturing of the bedrock).

The vertical fractures are more observable in an outcrop due to surface weathering processes that accentuate and widen the fractures.

e. The nearby Nellie Stevens well is used as evidence for weathered formations found within bedrock and for high yield.

The KGS database shows that the Nellie Stevens well is located adjacent to the proposed landfill footprint in the buffer area and that it was installed in April 2000. However, no such well can be found at the property. Mr. Scott Alter, the landowner at the time in question, confirmed that the well was never installed at that location.

f. Water contours submitted by Golder Associates are not comparable with regional contours mapped in 1960.

The on-site groundwater contours closely match the regional flow information as depicted on Figure III-23 (April 2002) of the Hydrogeologic Investigation. The groundwater flow for both the on-site and regional areas is towards the southeast.

g. Only (groundwater) contours for the discontinuous bedrock zones were submitted.

The bedrock aquifer is continuous throughout the landfill footprint, the overburden is discontinuous and will be mostly excavated. Waste Connections submitted the proper information.

h. *The Plumb Thicket well logs posted on the KDHE web site indicate only 2 wells are dry, not 19. The static water level of the 17 wells mapped as dry, actually averages 26 feet and the levels range from 7 to 45 feet.*

The KGS website showing well water levels is based on first water encountered. Subsequent purging of the wells and piezometers removed that water and no additional water flowed back in. These wells and piezometers listed in the application as "dry" have continued to be dry in later water level measurements during the quarterly sampling events.

i. The permit application (wrongly) summarizes the quality of water on the site as inadequate for domestic or stock use.

Waste Connections correctly referred to the bedrock groundwater as inadequate for domestic or stock use based on information from the KGS Bulletin 143, "Geology and Ground-Water Resources of Harper County, Kansas," by Charles K. Bayne, 1960.

j. Is it practical to site a landfill where erosion is a hazard?

Erosion is a potential problem everywhere in Kansas. Erosion controls are required throughout construction and operation of landfills to prevent problems.

k. *Is it practical to site a landfill where flooding is a hazard?*

Plumb Thicket Landfill is not located in a 100-year flood plain, which is consistent with the regulatory requirements.

l. *The footprint area will be excavated up to 70 feet deep. How can the monitoring wells detect groundwater contamination when the wells are only 26 feet deep?*

Well depths, which range from 10 to 80 feet below ground surface in the proposed footprint area, monitor the groundwater that flows beneath the landfill. See Comment 2x.

m. *If the northern part of the footprint is excavated first, what will prevent contamination from entering the natural drainage ways during a heavy rainfall directly south of the cell.*

The southeast portion of the proposed footprint is scheduled to be excavated first. The northern portion of the proposed landfill is scheduled to be excavated last. In any case, leachate will be contained in the landfill and holding tanks, and not released to natural drainage ways.

n. *If storm water runoff is detained at the site, will the land at lower elevations see a decline in groundwater recharge?*

The storm water management system was designed to release runoff at pre-development rates, so as not to alter downgradient conditions.

o. *Based on KGS regional information (Bayne, 1960) this article better describes the geology in the southern half of Harper County, not the northern half.*

The regional and site-specific geologic information matches well.

p. *KDHE has promoted this site as a practical location for a landfill. The local government in Harper County has been convinced to approve this site, based on KDHE's persuasion and not the true facts. Waste Connections and KDHE did not furnish the important technical information that would indicate this location is a very sensitive area and deserves the highest level of environmental protection. All features that would indicate this is not a practical site for a landfill has been omitted from the permit application.*

KDHE objectively considered this location with respect to all landfill siting criteria. The agency answered questions about the proposed location, reviewed the application, and found it acceptable. KDHE also investigated the site using other sources of information, including public comments, and found that information provided by the applicant was accurate.

KDHE reviewed the technical aspects of this site and found no reason to reject the application. In accordance with Kansas Statues Annotated 65-3407(b): "If the investigation reveals that the facility or area conforms with the provisions of the act and the rules and regulations and standards adopted thereunder, the secretary shall approve the application and shall issue a permit for the operation of each solid waste processing or disposal facility or area set forth in the application." All information has been provided and reviewed as required under the rules and regulations for MSWLFs.

q. *We purchased a home 1-1/2 miles southwest of the proposed site...it has a creek and a spring-fed pond behind it...if all the mitigation and construction is allowed, won't it be possible that our wildlife habitat and pond will be affected?*

It is highly unlikely that the landfill would affect any surface waters, including a creek and pond 1½ miles to the southwest. As previously noted, the landfill will have a composite liner system, leachate collection system, storm water controls, groundwater monitoring wells, and other features to prevent the release of contamination. Based on groundwater gradients and surface topography in the area, groundwater and surface water generally flows southeast from the landfill property.

r. *There is an apparent discounting of the unique surface overburden dynamics which appear to be a pristine ecological recharge area as opposed to isolated perched water. This water cascades down to the flats prior to running into the Chikaskia River and along the way helps to recharge and sub-irrigate farm and ranch land and domestic water wells. By halting those dynamics, by trapping the original runoff plain, an area will be impacted far greater than the landfill site proper.*

A relatively small amount of precipitation will be removed from the local hydrologic cycle. Precipitation that falls directly onto active waste disposal areas will be contained and managed as leachate – recirculated on the waste to enhance organic decomposition, evaporated, or hauled to a wastewater treatment plant. Although the landfill is permitted at 229 acres, much less area will be open at any given time. Areas that have not been filled yet, or areas that have been filled and covered, are allowed to drain into the surface water management system. After temporary storage to remove excess sediment, drainage will be slowly released to existing streams. Therefore, any existing recharge will not be significantly changed.

s. *Why take any risk at all when it is not necessary? This is a big state and offers many locations for a landfill that do not put us at so much risk.*

There is no location in the state in which a landfill would present zero risk to human health and the environment. However, it is true that some sites may be riskier than others. Nevertheless, the state statutes and regulations do not authorize KDHE to require that only the lowest risk sites be used for landfills. Instead, the rules require KDHE to issue a landfill permit for any site where a landfill is proposed that conforms to the statutes and regulations.

The statutes and regulations set forth criteria that effectively require landfills to have acceptably low risks.

While this approach may seem less sophisticated than requiring landfills to be located only in the lowest risk locations, consider that there is no universally accepted notion of what constitutes the lowest risk location. Also, there are competing issues when it comes to landfill siting – for example, should landfills be located as far away from population centers to avoid the very low risk of contamination, or should they be located close to population centers to reduce transportation costs and associated air pollution? These are but some of the dozens of parameters that would have to be considered, and who would decide which costs and risks are more important?

t. *There is no possible way that anyone can guarantee there will be no contamination even after extreme cautions are taken to prevent such a catastrophe. No one can predict or stop the future or human error. There are endless possibilities that could go wrong. Now is the time to stop such risks, by stopping the landfill from being put in. All we are asking is for another spot, a safer spot to be chosen, one that will not have any risk of ruining our water supply.*

As previously described, there are many safeguards required to prevent contamination or control it before it migrates from the landfill property. Also noted above is the fact that there is no such thing as a zero-risk location.

In addition, there is no such thing as a location where a new landfill would be completely unopposed. We all rely on landfills for safe and responsible disposal of the waste that each of us generates, and most people would be against paying exorbitantly high fees to transport the waste far away, yet nobody wants a landfill near them.

As previously explained, the state statutes and regulations require all landfills to protect human health and the environment in ways that limit risk to acceptably low levels. This landfill meets those requirements. Any contamination will be addressed by the owner under the supervision of KDHE.

u. *What would be the watershed impact when/if the liner breaks?*

KDHE required the landfill design firm to analyze this scenario. Using worst-case assumptions, they found that leachate would travel at a rate of about 4.5 feet per day in the underlying bedrock. At that rate, the leak would be detected at the groundwater monitoring wells within several months. Then the buffer zone would allow a year or so for design and installation of a system to prevent migration of contaminated groundwater from the property, if the levels of contamination warranted that type of corrective action.

It is worth noting that the chances of such a liner break are relatively small until the distant future, when the consequences of a break will probably be less serious. The liner will be placed on a solid foundation of compacted soil and bedrock. Stability analyses have been

performed and show that little settlement or other movement is expected. Throughout the operational life of the landfill, large amounts of contaminants will be removed in leachate and landfill gas and treated. Other contaminants will be trapped in the waste mass, which forms a medium that functions like a filter. Much of the organic fraction of the waste will decompose over time, and the landfill will become more inert. This is not to say that it will no longer present a risk to human health and the environment, but rather to explain that the risk will decrease over time.

v. *The creek that runs south out of the proposed dump site runs less than 10 yards from where we drilled my water well. I am sure some of the surface water gets into my well because of the high water level. No one else has ever mentioned the chance that the trucks hauling the waste to the dump leaking "no telling what" out of them along the road and while they are entering the dump to weigh. When it rains, this will wash down the hill west to the creek that runs through my back yard and into my water well.*

If surface water is currently entering your well, you may want to replace your well to reduce health risks. This suggestion would apply even if the landfill did not get constructed – perhaps more so then, because of the significant risk of pathogens entering your well from upstream agricultural activities. For more information, contact the Harper County Sanitarian / Local Environmental Protection Program director (Kyle Clark, 620-842-6000) or KDHE's Watershed Field Coordinator (Richard Basore, 316-337-6014). See Comment 1h.

As previously noted in these responses, waste collection and transport vehicles must prevent releases of waste, even the liquid portion of the waste. If waste collection vehicles leak on their way to the landfill, someone will notice it and report it to KDHE, and the responsible party will have to correct the problem and might be fined or otherwise penalized.

As part of the required environmental monitoring of the landfill site, the landfill owner will periodically sample and test surface water discharged from the site to ensure that the water quality is acceptable. KDHE will audit those test results to see that appropriate procedures are used and to require corrective action if necessary.

Incidentally, modern facilities for solid waste disposal, such as this one, are called "sanitary landfills". KDHE and other agencies call old, unlined waste disposal areas "dumps".

9. <u>Concerns About Financial Assurance</u>

a. *If I remember correctly, it was stated that WCI is behind in payments to their trust fund (post-closure and closure fund).*

Waste Connections has satisfied the state requirements for closure and post-closure financial assurance.

b. *What assurance does KDHE have if there is a major problem at the landfill that WCI won't cease operation and run for the hills? Individuals of a corporation aren't liable.*

There are several reasons to believe that Waste Connections would not, and could not, absolve themselves of responsibility for this landfill. First of all, if or when a landfill permit is issued Waste Connections would be required to sign a certification statement acknowledging their responsibility for the landfill. Secondly, Waste Connections owns the land where the landfill is located, and as such they are responsible for any damages. Thirdly, Waste Connections will be the primary hauler of waste to the landfill, which further increases their responsibility for the site.

In the unexpected event that Waste Connections fails to fulfill its obligations with regard to the landfill, several very serious consequences would occur. KDHE would seize the financial assurance funds in order to hire a contractor to properly close and maintain the landfill. Waste Connections would probably be faced with lawsuits for breach of contract with the county and other entities. Furthermore, Waste Connections would thoroughly tarnish its reputation and probably would not obtain another permit in any state after that. The company might also lose waste collection contracts and would probably go bankrupt.

As for the culpability of corporate officers, past lawsuits seem to show that liability gets assessed to the corporate entity as well as its officers.

c. *What happens if WCI changes from a trust fund to insurance policy, they fail to pay premium and go belly-up, or the insurance company goes under -- then what?*

KDHE monitors the fiscal standing of financial assurance providers. If a provider slips to an unacceptable rating, KDHE requires permit holders using that financial assurance provider to renew their funding through a new provider, in good standing, within 90 days.

d. *Has the financial condition of Waste Connections been checked?*

KDHE checked the financial condition of Waste Connections and found it acceptable.

e. *Property deed shows mortgage held by Scott Alter. Who is responsible for contamination if Waste Connections defaults on payment to the mortgage holder?*

Waste Connections owns the property. As the entity that applied for and was issued a solid waste landfill permit for this property, Waste Connections is responsible for preventing and addressing any contamination regardless of the mortgage status.

f. *What is amount of closure bond and is it indexed for inflation as years pass? Does Kansas have a procedure to double-check that premiums are paid every year and not allowed to lapse?*

The closure and post-closure financial assurance amounts for this facility are currently estimated to be $3,299,200 and $4,443,210, respectively. State regulations require adjusting these figures each year to account for inflation and other factors (such as possible changes in

the facility design and operations). KDHE requires landfill permits to be renewed annually, at which time the agency checks whether financial assurance instruments are properly funded.

g. How do they fund trust if they go out of business or sell site?

If a trust fund is used as the financial assurance mechanism, the permittee has to pay a percentage of the total closure and post-closure estimated costs each year until the trust is fully funded. Usually a permittee would pay one-thirtieth of the total estimated costs each year for thirty years.

If a company using a trust fund for financial assurance went out of business or otherwise failed to fulfill their legal obligations for closure and post-closure care of the landfill, the state would seize the amount of money currently in the trust fund. Since the trust fund grows concurrent with the amount of waste disposed in the landfill, a partially-funded trust might cover the costs associated with closure and post-closure care of a partially-filled landfill. On the other hand, it is possible that the costs could exceed the funds. This is one reason why several years ago KDHE proposed a contingency fund to cover various possible failures of financial assurance mechanisms. However, the legislature did not approve it.

If the landfill owner sells the property, the state would not release the seller's financial assurance unless or until the buyer established acceptable financial assurance. The buyer would also probably apply for a permit transfer in order to continue operating the landfill.

10. <u>General Opposition to Landfills, etc</u>.

a. It seems that Kansas should not allow any more landfills no matter what classification or title you can give them. We should preserve the water we have because it costs too much to start clean up procedures.

On average, we generate about 4 pounds of solid waste per day per person. In order to protect human health and the environment, there have to be facilities where the waste can be disposed. At present, the most economical way to dispose of solid waste in Kansas seems to be landfills (as opposed to hauling the waste out of state, incinerating it, composting it, etc.).

Prior to development of modern landfills waste was typically dumped along riverbanks and burned in open pits. The flies and rodents attracted to the waste were disease-spreading agents; the toxic emissions were a major inhalation hazard; and the unlined, uncontrolled dumps created significant water pollution. Modern landfills protect human health and the environment by preventing those types of impacts.

KDHE agrees that it is very important to protect water resources. State regulations require municipal solid waste landfills, such as Plumb Thicket Landfill, to be designed, constructed, operated, closed, monitored, and maintained in ways that will protect water quality.

b. Sedgwick County should take care of its own trash, not ship it off to contaminate another county.

While some people might consider it appropriate for each county to dispose its own waste within in its boundaries, state law does not prohibit waste disposal outside the county of origin. Indeed, as shown by a map of solid waste flows in Kansas available on the Bureau of Waste Management web site, dozens of counties transfer waste for disposal outside their boundaries. In fact, Harper County's waste is currently disposed in neighboring Barber County.

Waste disposal is a form of commerce that is influenced by market forces such as supply, demand, and costs. Experience shows that larger, regional landfills are often more cost-effective than smaller, local landfills.

c. I believe full privatization of waste management has been a mistake. Citizens lose power over this public service with every decision made by companies. By allowing Waste Connections this venture, we give them greater leverage over future waste considerations. Ultimately I believe Wichita needs to franchise trash services. The time to reverse the privatizing trend is now.

This comment was about waste collection services in Wichita. KDHE is not involved in local decisions about waste collection contracts or services. KDHE recognizes the importance of public and private entities in properly managing solid waste, and works with both the public and private sectors to ensure protection of human health and the environment.

d. What has Wichita done to reduce their waste stream, particularly household hazardous waste?

KDHE actively promotes waste reduction, including diversion of household hazardous waste (HHW) from landfills. For example, KDHE administers rules requiring all counties or groups of counties (regions) to prepare solid waste management plans that among other things set waste reduction goals. KDHE also regulates HHW collection facilities, one of which is located in Wichita. The Sedgwick County HHW collection facility diverted over 740,000 pounds of household and small quantity generator hazardous waste from land disposal in 2004. However, waste reduction (including use of HHW facilities) is voluntary, and state laws do not authorize KDHE to base decisions about landfill permits on the waste reduction practices of the areas to be served.

e. Does Kansas have a so-called self-audit law which makes discovered problems privileged information?

Current solid waste management regulations require owners/operators of solid waste facilities, including landfills, to report environmental problems to KDHE. Those reports, KDHE's inspections, and associated correspondence are available to the public under the

Kansas Open Records Act. However, KDHE may be working with the legislature next year to try to repeal or modify the audit law to resolve EPA concerns.

f. The Wichita City Commissioners are now beginning the process for their own landfill site which will be located in Sedgwick County. If this becomes a reality, Harper County will be left with a trash mess, and Sumner County will be left with permanently contaminated water in the Chikaskia River.

Even if a landfill were opened in Sedgwick County, Waste Connections would still be responsible for the proper construction, operation, closure, monitoring, and maintenance of the Plumb Thicket Landfill in Harper County. If Waste Connections chose to close that landfill early, it would have to be accomplished in an approved manner that would be protective of human health and the environment. Previous responses have explained that safeguards are required to prevent the landfill from contaminating the Chikaskia River, and this holds true whether the landfill operates for the entire planned life or closes early.

A number of things would have to happen in order for a landfill permit application on a Sedgwick County site to be considered by KDHE, including: someone would have to prepare the application, Sedgwick County would have to amend their solid waste management plan to allow a landfill, and the county would have to approve the landfill zoning/land use. Then, in order for a permit to be issued the application would have to satisfy state statutes and regulations. KDHE cannot predict the outcome of any of these or other actions.

Another factor is that the majority of trash in Sedgwick county is collected by companies that own and operate landfills elsewhere in the region. Those waste companies might choose not to use a landfill run by another company and therefore a landfill in Sedgwick County may not be economically feasible.

g. If Harper County wants to earn some money with this landfill they should build it in the southern part of their county so they can smell their own problem. As far as I am concerned Wichita and Sedgwick County should keep their own smelly trash!

Harper County approved the special use permit for this landfill, but the county did not select the site location. Waste Connections, the landfill owner/operator, selected the site location based on considerations such as the availability of a large property, proximity to Wichita, conformance with state laws and regulations, etc.

Landfill odors are rarely noticeable from offsite. Landfill operators are required to control odors through minimizing the open area, applying daily cover, controlling landfill gas, etc. Any person who observes odor problems may file a complaint with KDHE's District Office in Wichita at (316) 337-6020.

h. I don't want a landfill in Harper County. I don't want a landfill anywhere near Harper County. I'm in the profession of working with teams of people to make decisions daily about what is best for children. The proposed Harper County landfill has not one thing to do with

what is best for children, their families, or particularly, their futures. Please listen, and hear, what the professionals and researchers around you have to say about the details regarding the proposed Harper County landfill and its detrimental implications.

KDHE cares very deeply about the welfare of children, and actively works to ensure their health and protection of the environment in which they live. As noted in previous responses, landfills are essential to protecting public health and preventing environmental contamination. It is a fact that humans generate solid waste, and if that waste is not managed properly the risk of disease transmission and pollution increases significantly. Consider third-world countries that have open dumps that present a host of health and environmental problems. Conversely, the Plumb Thicket landfill proposed in Harper County will be a state-of-the-art facility that meets all federal and state requirements. The landfill was designed and approved by Professional Engineers and Professional Geologists licensed by the State of Kansas. Professionals and researchers throughout the country have confirmed the health and environmental protection features provided by municipal solid waste landfills such as this one. Waste management facilities such as this are in the best interest of all members of society, including children.

i. *No one seems to be checking into the idea of recycling. Why drive fifty or so miles to mess up a unique area to recycle, then backhaul the compost back? It has been recently concluded that the increasing fragmentation of the natural areas of the country are resulting in considerable degradation of our ecosystem; that wildlife and the whole natural system cannot continue to lead a healthy existence as a result. Since we are an intrinsic part of this world, our continued existence is directly dependent on its protection. Fragmentation of the Plumb Thicket area is simply not the right way to go. This area would make a great state park!*

Recycling is a very important part of the waste management approach promoted by the U.S. Environmental Protection Agency and KDHE. In general, the preferred waste management strategies include waste reduction, waste reuse, and recycling if possible.

However, as a society we have not yet reached a point where these methods alone will handle all the waste. At present a large percentage of waste cannot be economically diverted, reused, or recycled. Therefore, treatment and disposal facilities such as incinerators and landfills are necessary to prevent open dumping and other illegal means of disposal. In Kansas, landfills are more cost-effective than incinerators.

As part of the review of this permit application, the Kansas Department of Wildlife and Parks determined that the landfill would not adversely impact critical habitat for threatened or endangered species. The state does not have authority to block development of a landfill on private land if it meets all the statutes and regulations. Consider that other types of land use such as farms, stores, factories, roads, and homes also result in the loss of undeveloped natural land. In fact, landfills are somewhat unique in that when they close they often revert back to natural habitat. When Plumb Thicket Landfill is closed, it will be a hill covered with several feet of soil and native grasses. Environmental management and monitoring systems

will remain in use as long as necessary to protect against harmful releases of leachate and methane.

11. <u>Concerns About Fairness, Property Impacts, etc.</u>

a. We do not deserve this inhumane treatment as there are third and fourth-generation families of hard working people in the area of the proposed site. Their rights have been violated. People should not be forced out of their homes and rural way of life for a regional landfill.

KDHE cares about the wellbeing of all individuals. The agency is not aware of any inhumane treatment, violation of rights, or instances where anyone has been forced from their homes or land with regard to this landfill. If such things occurred, you may report them to appropriate law enforcement officials.

Perhaps you meant that some people view the landfill as infringing on their property rights because it is nearby and offensive to them. The acceptability of land uses is a local government decision. Harper County approved a special use permit for the landfill at this location.

It might be worth considering that people tend to resist other types of development near their homes. For example, rock quarries often meet the same type of resistance that landfills do. Even commercial and residential developments meet opposition from individuals who became accustomed to having undeveloped land near their homes and then see it disappearing. However, the entity that proposes a landfill or other type of development also has property rights. The landfill owner followed the laws and has a legal right to use their property in the permitted manner.

b. This landfill will damage our environment and the reason we moved here will be forever changed. Our lives have already been affected mentally and physically through this two and a half year ordeal. Approval will only create chaos and devastation.

The proposed landfill is an engineering designed waste containment facility that will serve its function of protecting human health and the environment. Environmental impacts from existing agricultural, industrial, and municipal sources in the county may be greater than even a worst-case scenario release of pollution from the landfill.

One of the largest waste management companies in the U.S. would not stay profitable for long if its landfills caused "chaos and devastation", nor would KDHE approve it. The landfill will be developed in an orderly manner, with measures in place to prevent environmental impacts. These measures will include erosion controls, sediment traps, tight bedrock base, composite liner system, leachate collection and management system, storm water management system, landfill gas monitoring and management system, groundwater monitoring system, surface water monitoring, etc.

c. Barber County has worked with us to supply a place for our trash and it doesn't seem right to do something that would adversely affect them.

For years municipal solid waste generated in Harper County has been disposed in the Barber County landfill. This has benefited both counties in that Harper County has a relatively short distance to haul the waste and Barber County's landfill revenue has been higher than it would otherwise be. If Harper County had to haul the waste farther, say to a regional Subtitle D landfill, their disposal costs would be higher. If Barber County did not have the additional revenue from handling Harper County's waste it is unclear whether their landfill would be cost effective.

It is notable that Barber County and other counties in the Gyp Hill Solid Waste Planning Region agreed to amend the solid waste management plan for the region to allow a regional landfill in Harper County.

d. Directly across the road south of Plumb Thicket is a fish farm consisting of eight to ten spring-fed fishponds full of mostly channel catfish, perch, blue gill, and bass. These fish are sold all over Kansas and the surrounding states. These fish ponds will surely become polluted, the fish will die, and the entire fish farm will be no more.

As noted in previous responses, extensive controls will be employed to prevent releases of pollution from the landfill. There is a very low risk of environmental contamination, and it is extremely unlikely that there would be any impact to the nearby aquaculture.

e. Why do we need to accept the responsibility of Wichita's trash when it benefits Waste Connections and it will not benefit Harper County? You are putting the responsibility on the wrong community.

The residents of Harper County and the county government are not accepting any responsibility for Wichita's trash. Waste Connections, the landfill permit holder and owner of the landfill property, is responsible for trash from the time they collect it through perpetuity or until another entity assumes responsibility.

While it was not part of KDHE's decision to issue the permit, Harper County will in fact benefit from the landfill. It will provide substantial host fees and other benefits such as jobs and free/reduced-cost waste disposal for the county.

f. There has been no regard for changing of the original route to an alternate route that will subject a legally blind and deaf young woman to heavy industrial traffic – 200 trucks a day traveling on the only road she has to travel on.

Waste Connections will be using public roads and highways, and the route in Harper County is subject to the county's approval. Waste trucks will comprise a relatively small percentage of the total traffic on the highways, although they might be a substantial percentage of the traffic on the local roads leading to the landfill.

Anyone traveling on roads anywhere should exercise caution and understand the risks involved.

g. *This landfill traffic will have a great affect on the farmers moving equipment from field to field. This is the farmers' home. They were here first, not Waste Connections, Inc.*

Public roads are for everyone's use. Farmers already share the roads with other traffic here in Harper County and throughout every Kansas county.

h. *Plumb Thicket is one of the few sections left in this township that is not occupied by a home or the path of a river. The growth of this area is due to the fact that it is the shortest route to Wichita and the land is beautiful. A solid waste landfill will reduce the property value of nearby homes and hurt the growth of future development.*

The facts that the area is sparsely populated and is along a direct route from Wichita are some of the considerations that Waste Connections must have taken into account when deciding where to propose a landfill. While the land is scenic, that does not protect it from any type of development that is approved by the local government and meets all regulatory requirements.

Property owners adjacent to or near proposed landfills frequently express concerns about property values. Unfortunately, there is no way to definitively evaluate the impact of a landfill on surrounding property values other than to observe the "before" and "after" sale prices and account for other variables such as real estate trends, inflation, interest rates, etc.

Decades from now, when the landfill is slated to close, the site will revert to grassland which could be viewed as an amenity by some buyers.

i. *My family lives about five miles north-northeast of the proposed site, where the general direction of wind is from the south. I was concerned about the smell coming from this landfill, are you going to buffer the smell in some way? Every time we pull up to the stop sign south of our house are we going to have to look at the mountain of Sedgwick County trash being built? It is not fair to the people of Kingman County to not have a voice in the matter.*

The KDHE permit public review period provides interested parties the opportunity to submit comments. We appreciate the fact that you submitted comments.

Odors will be minimized through application of daily cover, landfill gas management, and other means. Odors that emanate from the landfill would normally disperse quickly. If odor problems occur, the landfill operator will be required to take additional actions such as use of odor-masking or neutralizing agents. Depending on where you are situated and what phase of the landfill is active at a particular time, the topography of the area may block the view of this landfill from most directions at a distance of five miles.

j. Waste Connections has promised all the residents in Harper County free trash disposal as I understand it. In other words, they can take their trash there and dump it for free. I think the same applies to Barber County, Kingman County, and Sumner County. What do you think that is going to do to the traffic on the weekends? Rather than have a single truck hauling a big load, there is going to be hundreds of cars going to that dump because it is free.

Based on the special use permit issued by Harper County to Waste Connections, it is KDHE's understanding that Harper County residents will not be charged for trash disposal. This benefit does not appear to extend to residents of other counties.

According to 2005 figures from the U.S. Census Bureau, the population of Harper County is about 6,238. In 2000, the most recent year with available data, there were 2,773 occupied housing units in Harper County. If we assume that 5% of those households hauled waste to the landfill during a peak hour, that would be 139 vehicles per hour, or an average of 2.3 vehicles per minute. Neither of these rates would overload the two-lane roads. The landfill operator may have to schedule additional staff during busy times and develop procedures to safely handle this many customers. Some other landfills in Kansas have free disposal for residents, and KDHE has not heard of any traffic problems associated with that.

The landfill's operating plan indicates that they will provide convenience drop boxes near the entrance for residential customers to efficiently deliver trash without having to travel into the waste disposal area. Landfill staff will empty the drop boxes into the disposal area as necessary.

k. You can see many houses in Harper that are empty because of this landfill and there will be many more. I will definitely be one to leave this county if the dump goes in. It will take away the peaceful, quiet, clean country living I have enjoyed here the past 12 years.

According to year 2000 figures from the U.S. Census Bureau, there were 497 vacant housing units at that time. Since that was prior to the landfill proposal, there does not seem to be a direct connection between unoccupied housing and the landfill.

12. <u>Geological Issues</u>

a. There are seismic faults at the proposed landfill site.

According to the KGS publications, there are no seismic faults at the Plumb Thicket site.

b. There is karst topography at the proposed landfill site.

See Comment 2jj.

c. *The wells listed by Waste Connections in Harper County as dry wells do not conform with the WWC5 form responses found at the KGS website.*

Water levels shown on the WWC5 forms are the first water encountered during drilling, not water levels measured after casing installation. Many piezometers went dry after they were installed. These piezometers are located in the perched water zone in the overburden which is not continuous at the proposed landfill site.

d. *How will the proposed landfill excavation effect the uppermost aquifer?*

See Comment 2l.

e. *Local wells have high yields.*

The high yield wells are located in different geologic formations.

f. *The water table is very high and the site has springs.*

According to KGS publications and the site investigation, there are no springs associated with the contiguous bedrock aquifer. The perched water in the discontinuous overburden does provide water to springs. As the overburden is excavated during landfill construction, perched water in the overburden will be safely drained away and the existing springs within the landfill footprint will cease flowing. See Comments 2c & 2z.

g. *There are seismic boreholes and oil wells at the site that need to be found and plugged.*

See Comment 2gg.

h. *Static water in wells at the site is at 0.7 to 11 feet below ground surface.*

The water levels noted in the WWC5 forms are the first water encountered in the boring, the water in the perched zones. The water levels in the uppermost aquifer have been confirmed to be much deeper in subsequent sampling events.

i. *The site is not geologically suitable for a landfill.*

The site meets regulatory requirements.

j. *Did KDHE water witch or choose well locations at random?*

Neither. All borings, wells, and piezometers were placed to best characterize geology and hydrogeology at the site and to design an acceptable groundwater monitoring well network for the proposed landfill.

k. Were monitoring wells installed within or below the bedrock?

Most wells are installed in the bedrock, however some wells were strategically placed in the alluvium around the landfill.

l. How did recent drought condition effect the Waste Connections hydro investigation?

Due to the lack of primary porosity and tight fractures forming the secondary porosity, groundwater recharge in the bedrock from precipitation should be minimal. The actual effects of drought can only be determined through long-term groundwater monitoring.

m. How will increased precipitation affect groundwater?

Increased precipitation in the area may cause a subtle raising of the water table. Semi-annual groundwater elevation measurements will record any such change and KDHE may then require a change in the design plan for future landfill cells.

n. How deep are the groundwater monitoring wells required to be?

All wells must be in the uppermost aquifer that would provide the earliest detection of groundwater contamination. At this site the depths vary between 10 to 100 feet below grade.

o. Will groundwater monitoring involve only near surface waters or do wells extend into the bedrock?

Wells are screened both in the bedrock and overburden. The monitoring well network consists of upgradient and downgradient bedrock and overburden wells designed to monitor the quality of groundwater entering the proposed landfill site, flowing under the landfill footprint, and leaving the site. A bedrock well is placed every 500 feet in the downgradient direction to the south, southeast, and east of the footprint. At least three additional nests of wells are required for the northeast corner of the footprint (the "panhandle") in both the overburden and bedrock aquifers. At least two more bedrock wells are required in the southeast corner of the footprint at the elevation of the base of the landfill excavation. Finally, an existing overburden well in the southeast corner of the main landfill footprint will be sampled when water is found in it.

p. What are the depths of borings at the proposed landfill footprint?

10 to 100 feet below ground surface.

q. What happens during excavation when one of the pools (in the overburden) is hit?

The alluvial perched water is not a "pool", but rather wet sand that can be excavated. Little standing water should remain in the footprint during excavation. See Comment 12f.

r. *Have all vertical fractures been identified?*

All vertical fractures have not, and cannot, be fully identified at any site. Few vertical fractures were encountered throughout the hydrogeologic investigation for this site. Fracturing at the site is primarily horizontal and therefore the primary flow will be horizontal, not vertical.

s. *What is the water table depth inside the proposed landfill footprint?*

10 to 56 feet below current ground surface throughout footprint in both overburden and bedrock.

t. *Leaks from the proposed landfill liner will travel deeper than the groundwater monitoring wells and will be missed.*

Very few vertical fractures were found at the site and the bedrock has an extremely low vertical hydraulic gradient. Any contaminant that reaches groundwater is expected to flow with that groundwater toward the monitoring wells.

u. *It is not perched water in overburden, it is an aquifer "because all of the (overburden wells) except two had static water level"*

See Comments 2c & 2z.

v. *There will be a 50 to 60 foot head of water in the bottom of the excavation from removed overburden.*

Most of the wet sand and silt will be excavated and no standing water is expected in the proposed footprint area. See Comment 12f.

w. *The overburden is an aquifer.*

See Comments 2c & 2z.

x. *Waste Connections and KDHE should investigate the geology between the proposed landfill site and the Chikaskia River.*

An investigation beyond the site boundary is not necessary at this time. Waste Connections has adequately demonstrated that the groundwater is properly monitored at the site.

y. *Is 40-year-old geology information reliable?*

The regional geologic information remains accurate, however updated information regarding groundwater depth and site-specific ground water flow and geology was required to

characterize the site. That was completed with the hydrogeologic investigation performed by Golder.

13. <u>Siting, Design, and Performance Questions</u>

a. I don't know how big a cell is.

The total permitted waste disposal area is 229 acres. It will be developed in 15 sequential phases. The average phase will be about 15 acres. The phases will be constructed directly adjacent to each other and filled to form one contiguous waste disposal unit that could be considered a cell.

Within the overall disposal area, volumes of waste that are placed each day and then covered with six inches of soil might also be considered cells. In the plans for this landfill, those "daily cells" are designed to be approximately 150 feet long by 30 to 45 feet wide by 10 to 15 feet high.

b. Just how much leachate does KDHE allow a landfill to leak? Where is the statute or regulation in print? How much leakage is considered (based on U.S. EPA guidelines) to be a reasonable level? How are those guidelines established and is the U.S. EPA in the process of changing those along with lowering the standards on clean water? I'd like to have those guidelines, please.

KDHE does not allow any leachate leakage from landfills. This is addressed in Kansas Statutes Annotated (K.S.A.) 65-3409(a)(3) and Kansas Administrative Regulations (K.A.R.) 28-29-104(e)(3)(D), and in the intent of other rules. The solid waste statutes and regulations are available on the Internet at <www.kdhe.state.ks.us/waste>, under "Solid Waste Statutes and Regulations".

Landfill regulations promulgated by the U.S. EPA are found in 40 CFR Part 258. Those rules were the basis for the Kansas municipal solid waste landfill regulations. The federal regulations do not specify an acceptable leakage rate; instead they require landfills to have composite liner systems and leachate collection systems. The minimum requirements for a composite liner system are 2 feet of compacted soil having a hydraulic conductivity of 1 x 10^{-7} centimeters per second, overlain by a flexible membrane liner (also known as a geomembrane). KDHE requires at least 60 mil high density polyethylene for landfill liner geomembranes. Landfills also must have leachate collection systems to prevent leachate accumulation on the liner.

Leakage through composite liners is negligible except through defects such as a hole in the geomembrane. The purpose of the low permeability soil under the geomembrane is to minimize the leakage in the event of such defects.

Kansas has construction quality assurance (CQA) criteria that require rigorous testing of liners during construction, to prevent defects. Nevertheless, no amount of testing can ensure zero liner defects.

The web site <www.landfilldesign.com> includes a calculator for estimating the leakage rate through a composite landfill liner. Using the default values in that calculator, it is estimated that the leakage through one acre of composite liner would range from 1 to 3 gallons per acre per day depending on the defect types. This is considered a conservative (high) estimate because the model assumes that 12 inches of leachate will be standing over the defects, whereas the leachate collection system is designed to prevent that much leachate from building up on the liner. Other conservative assumptions are also built into the model.

KDHE is not aware of any proposal by EPA to change the landfill liner or water quality standards, apart from the normal updates of water quality standards that occur from time to time as more research is done. EPA guidelines are available online at <www.epa.gov>.

c. *We also have concerns over potential expansion as Waste Connections owns 958 acres in that area and we have been told that the Sumner-Cowley Electric high lines situated directly west of the landfill site and running north-south through the property will eventually be moved. Does this mean that Freeman Canyon will eventually be consumed in years to come?*

At this time waste disposal is restricted to 229 acres on the 958-acre property. During the course of developing the 229-acre disposal area, the owner will have to coordinate with an electric utility on the relocation of overhead power lines running through the site.

If the landfill owner wishes to apply for a permit modification to expand the landfill in the future, they will have to obtain approval from Harper County and KDHE, and the application would be subject to a public notice and hearing if warranted. Freeman Canyon is not a part of any disposal cell under this permit. No waste can be placed in that area.

d. *What household chemicals will degrade the liner and what is the manufacturer's warranty?*

Landfill liners are resistant to breakdown from household chemicals. More detailed information on this topic is available from manufacturers. One manufacturer's web site that addresses this topic is <www.poly-flex.com>.

Liner warranties vary by manufacturer and product. Since a liner has been specified but a manufacturer has not been specified, the warranty is unknown at this time. One manufacturer's warranty is available at <www.poly-flex.com>.

e. *Not if, but when the landfill leaks can the state of Kansas afford the cleanup bill and the legal problems of affected landowners and communities?*

If the landfill leaks, the owner will be required to perform corrective action to prevent offsite impacts. The landfill owner, not the state, will be liable. Waste Connections is required to provide financial assurance for this very reason.

f. Do you have any other Subtitle D landfills in Kansas or close to here that are leaking?

None that KDHE is aware of. Any contamination to date at Subtitle D landfill sites is from older, pre-Subtitle D cells.

g. Why shouldn't location be a primary concern for all landfills? Why do we have a medieval attitude that landfills always have to be built close to rivers?

Location is a primary consideration for all landfills, as required by state regulations. Landfills are not always located close to rivers. Plumb Thicket Landfill is located approximately two miles from the Chikaskia River, and meets the location restrictions in state regulations.

h. Why does everything always have to meet minimal standards? With the health and environment of Kansas at stake, why are you always talking minimal standards? In the issues of health and environment, why not quality standards? Why doesn't KDHE have a policy for maximum standards for maximum results?

Landfill regulations are established with certain minimum standards for features such as liner thickness and permeability. Landfill owners have to meet or exceed the minimum standards.

In construction projects for facilities such as landfills, lagoons, roads, etc., it is not feasible to require exact thicknesses, permeabilities, etc. Therefore, specifications typically allow certain tolerances, or ranges of values. The “minimum standards” represent the lowest acceptable values.

In reality, landfill liners usually get constructed somewhat thicker and with lower permeability than the minimum standards. Construction contractors typically overbuild the liners and other features so that when tested those features will be more likely to pass and the contractor will not have to go back and reconstruct them.

“Minimal standards” is not intended to imply that only a minimal degree of environmental protection is provided. Instead, satisfying “minimum standards” means that a facility meets regulatory requirements, which are established to ensure very low risks of impacts to human health or the environment.

It should be noted here that Waste Connections designed the landfill to exceed the minimum standards in several ways. They designed the landfill with buffer distances from the property line to the waste disposal area of 750 feet on the north and 1,000 feet on the east, west, and south (the minimum standard is 150 feet). Those large buffers decrease the chances of offsite impacts. Recognizing that leachate is most often present in the sump (lowest part of the liner

where leachate flows before being pumped out), they designed double composite liner systems under the sumps (a single composite liner system is the minimum standard). In addition, they designed the landfill with two leachate riser pipes per sump, on the remote chance that one of the pipes may get damaged as waste is placed over it (a single riser pipe per sump is the minimum standard). Waste Connections also designed the landfill final cover (cap) thicker than required in some areas to allow for additional landscaping.

i. How many feet of seams will there be in this landfill liner?

The permitted waste disposal area is 229 acres. A typical roll of 60 mil HDPE liner is 23 feet wide and 500 feet long. Panels are usually overlapped 4 to 6 inches for seaming, so for this estimate the effective width and length of each panel is assumed to be 22 feet and 499 feet, respectively. Therefore, each panel would cover 10,978 square feet. This means it would take approximately 909 panels to cover 229 acres (9,975,240 square feet). Based on above assumptions, the effective perimeter of each panel would be 2 x (22 feet + 499 feet) = 1,042 feet.

Therefore, the total length of liner seams is estimated to be the effective perimeter of a panel times the number of panels minus the perimeter of the overall waste disposal area (the top edge of the liner gets anchored in a trench) = (1,042 feet per panel x 909 panels) – 14,000 feet = 933,178 feet. Since there will be some odd-shaped panels in corners, patches where destructive samples are taken and where problems are fixed, etc., the total length of seams is rounded up to 935,000 feet.

To put it in perspective, that is approximately 177 miles of seams. This underscores the importance of construction quality assurance (CQA), which is required by KDHE. CQA involves testing 100% of the seams. Several tests are performed, in addition to visual observations.

Long, straight seams are double-fusion welded, that is, heat bonded with a small air gap in between. Testing these seams involves temporarily pressurizing the air gap and checking for pressure loss that would indicate defects that must be repaired.

Patches and some other smaller, irregularly shaped seams are extrusion welded, that is, a bead of plastic is applied along the seam to bond the panels together. Testing this type of seam involves applying a soapy solution over the weld, using a transparent vacuum box to exert a negative pressure, and observing whether bubbles form indicating defects that must be repaired.

Air pressure and vacuum box methods are non-destructive testing, that is, they do not damage the liner. In addition to those methods, destructive testing is also employed. Test strips of welded seams are cut at regular intervals and evaluated by shear and peel tests, in other words, determining the amount of force necessary to pull the test strips apart. Again, any liner defects identified during testing must be repaired.

j. I have heard that Sedgwick County has delayed a decision on landfills for 2 years. If they are in no hurry then why should we take them off the hook? We have heard from experts that the landfill is safe so there should be no problem permitting it near to Wichita. It would save a lot on hauling and it wouldn't cause a traffic problem here.

It has now been over two years since these comments were received in the spring of 2003. KDHE did not delay the decision as suggested in the comment; rather, it was delayed due to a court decision that has since been overruled and due to the time necessary to properly review the application and carry out the permit process.

In those two years Sedgwick County has continued to entertain the idea of a municipal solid waste landfill. However, no application has been submitted to KDHE for a landfill in Sedgwick County and the agency is not aware of any application being prepared at this time.

Waste Connections' application for the Plumb Thicket Landfill met the statutory and regulatory requirements, and that state law obligated KDHE to issue the permit.

k. There was an excellent bill that would prohibit a landfill from being built within a five-mile area of any Kansas river. Why didn't KDHE promote this legislation? Enclosed is a map of Kansas rivers. It was stated by an engineer from your department that no landfill would ever be built in Kansas if that House Bill and Senate Bill would have been passed. Please look at the map and honestly tell me if that is a true statement?

The referenced part of "Substitute for House Bill No. 2123" (2004) proposed that:

No permit to construct or operate a solid waste disposal area shall be issued on or after the effective date of this act if: (A) Such area is located within three miles of a stream with an average annual mean stream flow of more than 50 cubic feet per second, as measured at the nearest United States geological survey gauging station; and (B) the secretary, after consultation with the Kansas geological survey, determines that within 15 miles of such area there is a location which would be appropriate for a solid waste disposal area and which would have less potential for water pollution.

KDHE was asked to evaluate the merit of this bill. After studying the proposal, KDHE determined that it would rule out an unacceptably high percentage of the state and would not be practical for meeting future needs. The legislature agreed, and the bill was not passed.

l. Just how thick is the liner in inches and how can it be repaired if it is perforated and leaks?

The minimum required thickness for a municipal solid waste landfill liner of the type to be used in the Plumb Thicket Landfill is 24.06 inches. That includes 2 feet of compacted, low permeability soil (clay) and a 60 mil high density polyethylene liner (a mil is one-thousandth of an inch).

As previously described, liners are tested when they are constructed. After waste is placed it would be very difficult to locate and repair leaks, although this has been done in some cases by removing the waste and patching the liner.

In order to protect the liner from damage, heavy equipment is not allowed on the liner until a layer of protective material is placed. This landfill will have two commonly used protective materials over the liner including at least 1 foot of sand and at least 4 feet of select waste (trash from which large protruding objects such as pipes, structural metal, boards, etc. have been removed).

m. *The question was asked if there were any Subtitle D landfills leaking in the state of Kansas at the present time. KDHE thought they had just found one out at Dodge City. They weren't sure where it was coming from but their monitoring wells had picked up some contamination and I would just like the questions answered as to whether or not they had decided where it was coming from.*

KDHE determined that the source of contamination detected in the groundwater monitoring wells at this site was an old, pre-Subtitle D disposal area.

n. *Is the area Waste Connections wants to use to build a landfill the best place to build one?*

KDHE does not evaluate if it is the "best" place, just whether it is a suitable location that would conform to existing laws and regulations.

There is no universally accepted notion of what the "best" site for a landfill would be. There are numerous considerations when selecting a landfill site, and no site is "best" in all categories. Response 8c above discusses this further.

o. *Can anybody guarantee that regulations won't change within the next 60 years? Who is left to pick up the pieces?*

No one can predict the future with certainty, but if the past is an accurate indicator it is safe to conclude that environmental regulations will continue to evolve. When new landfill regulations were issued in the past, landfills that did not meet the new requirements were closed and subsequent landfills had to satisfy the new requirements. Landfill owners are responsible for adapting to new requirements.

It is worth noting that the current process for developing new or amended regulations involves input from the Kansas Department of Administration, the Attorney General's office, members of the public, and the legislative Rules & Regulations Committee. As a result, regulatory changes take time to enact and regulated entities are provided with appropriate transition periods to begin complying with new regulations.

p. I question the practice of accepting design engineering work from firms selected and hired by the applicant. Would it not be more acceptable for KDH&E to contract for the engineering, but require the applicant to pay for it?

It is standard practice for owners to hire engineers and other professionals directly. This is true for water treatment plants, sewage treatment plants, landfills, roads, bridges, buildings, dams, etc.

The Kansas State Board of Technical Professions licenses Professional Engineers and other professions in order to safeguard the public from unscrupulous, unqualified, negligent, or otherwise inappropriate practice of engineering and other professions. The rules of practice and code of ethics that professional engineers must follow requires them to hold paramount the health, safety, and welfare of the public and to report their findings objectively without bias to the interests of their clients. The Board has procedures for penalizing engineers and other professionals if they are found to violate the rules.

KDHE asked the Board to respond to the concern voiced by you and others. The Board assured KDHE that it is appropriate for applicants to directly hire their own engineers.

q. Since Kansas Department of Wildlife and Parks has requirements to protect the endangered species found on the site and much of this area cannot be used for cover dirt, where will cover dirt come from and how much additional truck traffic will be added for this part of the landfill operation? Also, what are KDHE specifications for cover dirt, whether from onsite or offsite.

Cover soil will be generated when the upper layers of soil are excavated from the 229-acre waste disposal area during landfill construction. The soil will be stockpiled onsite for later use. Additional truck traffic is expected to be negligible from this activity, since it will occur within the site boundaries.

Daily cover soil must be at least 6 inches thick and prevent blowing debris, limit access to the waste by vectors (flies, birds, rodents, etc.), prevent fires, limit odors, and shed precipitation. Intermediate cover soil must be at least 12 inches thick and serve the same purposes as daily cover soil, plus it should support vegetation if the area will remain out of use for more than 6 months.

Final cover soil includes at least 18 inches of compacted soil with a hydraulic conductivity of 1×10^{-5} centimeters per second or less and at least 2 feet of protective soil, the uppermost 12 inches of which must support vegetation. The final cover also includes a geomembrane and drainage layer.

r. The landfill capacity is designed for 44 million cubic yards for 63 years. How many truckloads would this be in addition to the present annual normal traffic flow on the highway / county road to the Plumb Thicket site?

According to Waste Connections, based on their current transfer operations and other estimates, about 60 to 75 transfer trailer loads per day will access Plumb Thicket Landfill from Wichita. These transfer trailers are 18-wheelers that gross at 80,000 pounds maximum. An additional 10 loads per day of commercial trucks (both roll-off and packer trucks) are anticipated from Wichita. Sumner and Cowley Transfer Stations are expected to deliver about five transfer trailer loads daily. Some waste hauling is already occurring between Wichita and the Waste Connections Red Carpet landfill in Oklahoma using Highway 2 for the return trip to Wichita.

Since the site is remote, and each sizeable population center in the region has access to one or more transfer stations, Waste Connections does not anticipate a significant amount of additional traffic. Their preliminary estimate is an average of 25 to 35 additional local commercial trucks (roll-off and packer trucks) and private trucks (pickups, flat beds, and hitch trailers) per day, and an occasional transfer trailer load from Harper.

s. *If there is a 5-mile radius restriction from airports for landfill siting, why don't the regulations include the same 5-mile radius restriction from domestic water sources?*

The solid waste regulations do not prohibit landfills within a five-mile zone around airports. Instead, the regulations require owners proposing to site new landfill units within five miles to notify the affected airport and the Federal Aviation Administration.

Landfills often attract birds. For safety reasons, it is important for airplanes to avoid bird strikes. Airplanes and birds generally share airspace at lower altitudes, when airplanes are ascending from takeoffs and descending for landings. The notification requirement for landfills proposed within five miles is intended to at least bring to officials' attention a possible hazard for aircraft to avoid if possible, and may help to limit or prevent new landfill units around airports.

Since landfills are designed to prevent releases of contamination to surface waters and groundwater, the regulations do not require owners proposing to site new landfill units to notify owners of domestic water sources within five miles and a federal agency.

When new landfill units are proposed, KDHE issues public notices and press releases, and holds public meetings and hearings as appropriate. Plus, the owner must obtain approval from the local government for the proposed new units. In these ways the public is notified about new landfill units.

t. *The overburden will be excavated to a depth of 70 feet. If my calculations are correct, there could be fifty to sixty foot head of water down in the bottom of the hole, which could create 30 psi. That is equivalent to about 4,300 pounds per square foot that the water could exert at the bottom of the liner.*

In order for there to be artesian pressure on the liner, confined groundwater would have to be present at higher elevations upgradient from the landfill site. That is not the case at this site,

which is located at the top of a hill. Some perched groundwater that currently exists in the overburden will be removed when the overburden is excavated. See Comment 12f. The landfill liner will not be subjected to high fluid pressures.

The liner will be subjected to substantial loads from the municipal solid waste and cover materials. However, calculations show that the liner and foundation will not fail under those loads.

u. *I did a calculation once on the miles of seams that would be in that landfill and it is over 99 miles of seam. Now, it is kind of unrealistic to think that you could do a seam for 99 miles and not have a few leaks in it.*

As noted above in response 13i, the estimated total length of liner seams is approximately 177 miles. While construction quality assurance measures will significantly reduce the number of defects, there is no guarantee that the liner will be free from defects. However, as shown in response 13b, the amount of leakage using conservative assumptions is very low (1 to 3 gallons per acre per day). One of the conservative assumptions used in that estimate is the presence of one liner defect per acre.

v. *How do you manage leachate that is collected in the storage tanks?*

Leachate will be managed by recirculating it into the waste (which will accelerate the normal process of biodegradation) and, when necessary, hauling it to a wastewater disposal facility.

w. *Is population density considered in siting?*

It would seem worthwhile to consider population density when selecting landfill locations, although the regulations do not directly address this. Waste management companies would probably find it advantageous to locate landfills near high population centers to minimize waste hauling distances. Environmentalists might agree because this would reduce fossil fuel use and associated air pollution. Conversely, lower population densities in close proximity to a landfill would be preferable to reduce potential concerns.

In the case of Plumb Thicket Landfill, it is within about 40 miles of Wichita, the largest population center to be served. On the other hand, there is a low population density in the immediate vicinity of the landfill.

x. *No more than 1 foot of leachate is allowed to stand on the liner. Is the corrosiveness different for 1 foot or 1 inch? Isn't it all the same? It contacts the liner to the same degree.*

The depth of leachate on the liner does not affect its chemical properties. The reason why the regulations limit the depth of leachate on the liner is to reduce the risk of leakage through any liner defects. It is important to note that liner defects are rare, as previously explained. Also, most of the time there will be much less than 12 inches of leachate standing on the liner, except in the sump (the lowest part of the liner from which leachate is pumped).

14. KDHE's Mission and the Need for Landfills

a. I think that concern for the health and welfare of people should come before regulations.

KDHE agrees that protecting human health is our highest priority. Statutes and regulations are a legal means to require standards designed to protect human health.

b. What is KDHE's mission: to serve the citizens of Kansas or out of state big business?

KDHE's vision is, "Healthier Kansans living in safe and sustainable environments." The mission of KDHE's Division of Environment is "Protection of the public health and environment." The Statement of Policy at the beginning of the Kansas Solid Waste Management Act (K.S.A. 65-3401) outlines several actions intended to promote safe and sanitary disposal of solid waste: "(a) Establish and maintain a cooperative state and local program of planning and technical and financial assistance for comprehensive solid waste management; (b) Utilize the capabilities of private enterprise as well as the services of public agencies to accomplish the desired objectives of an effective solid waste management program; (c) Require a permit for the operation of solid waste processing and disposal systems; (d) Achieve and maintain status for the Kansas Department of Health and Environment as an approved state agency for the purpose of administering federal municipal solid waste management laws and regulations; and (e) Encourage the wise use of resources through development of strategies that reduce, reuse and recycle materials."

Based on these mission/policy statements KDHE serves the state of Kansas by, among other things, working with businesses to accomplish waste management objectives. The state legislature directed KDHE to find mutually beneficial solutions to solid waste management. Realistically, companies would not get involved in waste management if it were not profitable; but just because it is profitable does not mean that it is not protective of human health and the environment. To the contrary, waste management enterprises that are not economically viable are destined to fail health and environmental standards. For this reason, KDHE researches the financial strength of waste companies and examines the feasibility of waste facilities before issuing permits. Experience has shown that large companies based in other states have acceptable compliance records just like companies, large and small, based in Kansas.

c. Did KDHE officials get involved politically to help kill an environmental bill to prevent the state the opportunity to choose a hydrologist company over allowing a landfill company the choice to meet minimum standards and prevent a safer distance from landfills to Kansas rivers?

KDHE was asked to provide input on Substitute for House Bill No. 2123, discussed in response 13k above. Part of that bill that you are referring to read as follows:

Before issuing any permit to construct or operate a solid waste disposal area within three miles of a stream with an average annual mean stream flow of more than 50 cubic feet per second, as measured at the nearest United States geological survey gauging station, the secretary shall contract for a hydrological evaluation of the proposed solid waste disposal area to be performed by an independent professional geologist licensed to practice in Kansas. The secretary may use such evaluation in lieu of a hydrological evaluation performed by the applicant. The cost of the evaluation shall be paid by the applicant.

KDHE advised a legislative committee that this requirement is unnecessary because KDHE has Professional Geologists and Professional Engineers to evaluate the validity of hydrogeologic investigations, and because this requirement would be inconsistent with the licensing function of the Kansas State Board of Technical Professions. Refer to response 13p above for additional information on this position. Prior to permit issuance, a revew was performed by geologists from the Kansas Geological Survey and KDHE staff not in the Bureau of Waste Management.

It is important to point out that landfill companies do not have a "choice" about whether they meet the minimum standards. All applicants and permit holders are required to comply with the statutes and regulations.

d. *I was up listening in the legislature when Mr. Bill Bider was giving his speech saying that we need more landfills. That is not true -- it has been documented that landfills such as Rolling Meadows and Hamm's Quarry have enough room to take all the trash that Kansas can generate for the next 80 to 100 years.*

Mr. Bider stated that new landfills would be needed from time to time as landfill capacities are reached and as solid waste planning committees decide new landfills are needed to serve the interests of the citizens, whom they represent. KDHE acknowledges that there are some large landfills in the state that currently have decades of remaining capacity. A map illustrating this is available on the Bureau of Waste Management web site at <www.kdhe.state.ks.us/waste>.

However, the remaining capacity in those landfills is based on the amount of waste that these landfills currently receive. If all the waste in the state were suddenly directed to one or two of these landfills, their remaining life would be severely shortened. Also, this could overwhelm the ability of these landfills to function properly until they hired more personnel, acquired more equipment, constructed larger disposal areas, etc.

Additionally, the costs to ship all of Kansas' waste to one or two landfills would be very high. It is much more cost effective to have regional landfills rather than transport large volumes of waste across long distances. It also conserves limited energy resources and minimizes traffic on state highways.

It is also important to understand that most landfills in the state serve only the county in which they are located. There are less than a dozen municipal solid waste landfills that

accept waste from outside their home county or region. Hence, prior to the opening of Plumb Thicket Landfill, the closest landfills for Wichita's trash were in Oklahoma, Garden City, and Topeka, which are all rather long distances away.

e. *Over the past two years KDHE has been very involved in helping the Harper County Commissioners promote the Plumb Thicket site.*

Harper County officials requested information from KDHE on a number of regulatory questions, and KDHE answered those questions without bias. Harper County officials also asked KDHE to present information about the regulations and permitting process at the zoning hearings and KDHE cooperated in that way, again without bias. KDHE as regulators is careful not to advocate for a facility or proposed facility.

As part of the regular process of reviewing a landfill application, KDHE held a public information meeting and hearing to answer questions and accept public comments. In the public notices for the hearing, and at the hearing itself, KDHE indicated that it had reviewed the application and found it to satisfy the statutes and regulations. However, KDHE also expressly stated that a final decision had not been issued yet and the agency would consider information provided by the public in forming a decision on whether to issue the permit. KDHE views this as an opportunity for public involvement and education.

f. *KDHE seems to be in the business of landfills and cleaning up contamination, not assuring Kansas that their water is and will remain safe. Will Kansas Water Authority step in and say no to this proposed landfill? Do they have the authority? That certainly falls within their mission.*

KDHE is required by law to ensure proper management of solid waste, which necessitates permitting landfills to contain the waste and prevent impacts to human health and the environment. KDHE is also charged with overseeing all sorts of environmental cleanup projects, again to protect human health and the environment. These activities are very important to improving and maintaining safe water supplies.

KDHE requested input from the Kansas Water Office (KWO) with regard to your comment. KWO advised us that they do not have authority with respect to landfills, and they rely on regulatory agencies (such as KDHE) to address applicable Kansas Water Plan objectives. KDHE reviewed the Kansas Water Plan objectives relevant to this landfill and determined that the landfill conforms to those objectives.

15. <u>Issues with the Application Process</u>

a. *Throughout the local permitting process, throughout everything, none of the concern or welfare for the people not just in this area but especially the people a thousand foot out have been disregarded. I have been asked to turn in the petitions that we circulated at the beginning that were ignored.*

KDHE was not involved in the local approval process, other than providing information and answering questions about regulations and the permit review process. KDHE is careful not to influence local decisions.

KDHE received the petitions that were submitted. However, decisions about permitting landfills are based on conformance with statutes and regulations designed to protect human health and the environment, and not on public opinion or petitions.

KDHE has gone to great lengths to consider public concerns about the landfill. However, none of those concerns constituted a legally valid basis for denying the permit.

b. *Please no rubber stamp of approval of a permit for Waste Connections. As we understand you have never turned one down; that's not a record to be proud of.*

KDHE has denied a small number of landfill permits. The reason why there is a small number of denials is twofold: applicants generally understand the requirements and usually do not apply for facilities that would not meet the regulations; and a number of applications have been "withdrawn" by applicants prior to the agency issuing a denial.

In any case, KDHE rigorously reviews landfill permit applications, and the application for Plumb Thicket Landfill was one of the most extensively reviewed landfill applications in the history of KDHE. After receiving the application KDHE examined it and issued a series of nearly 200 comments, many with multiple parts, identifying corrections and revisions required for approval. Multiple KDHE staff were involved in various parts of the review, spending well over 1,500 man-hours on this effort. In 2004 the Legislative Division of Post Audit audited KDHE's review of the Plumb Thicket Landfill permit application and determined that KDHE fulfilled its responsibilities professionally and objectively.

c. *KDHE says they made a mistake in permitting a C&D landfill for Cornejo in Wichita and you weren't given to renew the permit. Please don't make a mistake here and later not renew the permit; that's too late.*

The issue in the Cornejo permit has to do with conflicting legal opinions about whether the Arkansas River in Wichita is deemed navigable and used for interstate commerce. That issue is irrelevant with respect to the Plumb Thicket Landfill, as it is not within one-half mile of any major stream.

d. *Would you please send me a copy of all of the geologist's and engineer's reports as I would like to review these?*

These and most other documents in KDHE files are public information under the Kansas Open Records Act. If you wish to make an appointment to view the Plumb Thicket Landfill files, you can call the Bureau of Waste Management at (785) 296-1600. If you desire copies of items in the files submit a written request describing the desired items, agreeing to comply

with the provisions of the Kansas Open Records Act, and agreeing to pay $0.25 per standard page plus actual costs for larger copies and shipping.

Note that the permit application and associated documents (including engineering and hydrogeologic reports) were stored at the Harper County Clerk's office for about two months in the spring of 2003, in order to facilitate public viewing. KDHE issued public notices and press releases to publicize that fact, and also stated it at the public meeting and hearing.

e. *The county's solid waste plan, known as the Gyp Hills Regional Solid Waste Management Plan, that was in place at the time of the application did not provide for the regional landfill. It wasn't amended until in August of 2002, months after the Board of County Commissioners voted to bring in the landfill. Therefore, under the solid waste plan that was in place at the time of the application only a small arid landfill could be permitted under this special use that was submitted July 11, 2001. If a regional landfill is to be permitted a new special use permit needs to be submitted to Harper County / Cities Joint Planning Commission and new unbiased hearings need to be heard before the public.*

State statutes prohibit KDHE from reviewing a landfill permit application unless it includes a signed certification from the local government indicating that the application is consistent with the county or regional solid waste management plan. A certification meeting this requirement was provided with the permit application for Plumb Thicket Landfill received by KDHE in August 2002. This type of certification is not a prerequisite for special use permits issued by counties.

f. *KDHE will make decision and then answer comments -- does that mean your mind will be made up before you answer the questions posed?*

After receiving the public comments KDHE staff read each one and evaluated whether the comments warranted additional consideration, research, investigation, plan modifications, or other actions. KDHE issued questions and comments to Waste Connections to address some of the public comments. KDHE also communicated with several other agencies about some of the public comments. In addition, KDHE performed additional review of the application and some additional research about questions raised in some of the public comments. Finally, KDHE prepared these written responses to the public comments. In these ways, the public comments were thoroughly considered and helped the agency form a final decision on permit issuance. The agency prepares responses to public comments as a means of informing interested parties.

g. *From the day the application was received from Waste Connections of Kansas, Inc. for a permit to own and operate a regional landfill in Harper County, Kansas, what is the time period by statute to issue or deny the permit?*

The statutes and regulations do not impose a time limit for landfill permit issuance or denial.

h. KDHE regulations states 'must show a need'. I believe a reasonable doubt has been cast by the people of Harper County and the surrounding communities that there is 'no need shown' for a mega regional landfill in Harper County, Kansas.

K.S.A. 65-3407(b) states in part that KDHE "may consider the need for the facility in conjunction with the county or regional solid waste management plan." The word "may" in the statute means that this is an optional consideration, not required. KDHE practice has been to defer to local government decisions on land use. In the case of Plumb Thicket Landfill, Harper County issued a special use permit for the landfill and signed certifications that the landfill application was consistent with local land use requirements and the regional solid waste management plan. KDHE interprets those actions as demonstrating a need for the facility.

In addition, there were no municipal solid waste landfills in south-central Kansas that would accept Wichita's trash. The majority of that waste was being hauled hundreds of miles to landfills in Oklahoma and the Topeka area. This indicated a need for the landfill.

i. What one thing can stop you from permitting this landfill?

Any number of issues could result in KDHE denying a landfill permit. However, many problems can be readily solved. For example, some aspects of the landfill design were unacceptable or not shown in enough detail when KDHE first reviewed the application, but the plans were amended and additional information was provided to correct these problems. It is our standard procedure to work with all applicants on these issues.

There are some absolute, make-or-break issues that if not satisfactory cannot be corrected and would lead to denial of a municipal solid waste landfill permit. Some of these listed below. None of these issues prevented issuance of the Plumb Thicket Landfill permit.

- If an applicant fails KDHE's background investigation.
- If an applicant fails a criminal investigation by the attorney general.
- If a proposed landfill would be located within one-half mile of a navigable stream used for interstate commerce.*
- If a proposed landfill would be located within one mile of a surface water intake for a public water supply system.*
- If the application is not certified by the local government as being consistent with zoning/land use requirements.
- If the application is not certified by the local government as being consistent with the county/regional solid waste management plan.*
- If the applicant does not provide proof of ownership of the property where the landfill will be located.*
- If a proposed landfill would be located near an airport and the applicant does not demonstrate to KDHE's acceptance that the landfill would not pose a bird hazard.

- If a proposed landfill would be located in the 100-year flood plain and the applicant does not demonstrate to KDHE's acceptance that the landfill would not pose a hazard to human health and the environment.
- If a proposed landfill would be located in wetlands and the applicant does not demonstrate to KDHE's acceptance that there will be no net loss or degradation of wetlands, etc.
- If a proposed landfill would be located within 200 feet of a Holocene fault and the applicant does not demonstrate to KDHE's acceptance that the landfill would not pose a hazard to human health and the environment.
- If a proposed landfill would be located in a seismic impact zone and the applicant does not demonstrate to KDHE's acceptance that the landfill has been designed to resist the maximum horizontal acceleration in lithified earth material for the site.
- If a proposed landfill would be located in an unstable area and the applicant does not demonstrate to KDHE's acceptance that the landfill has been designed to ensure the integrity of the structural components.
- If a proposed landfill would pose a threat of harm or destruction to the essential features of an irreplaceable historic or archaeological site that is listed on the historic register.
- If a proposed landfill would jeopardize the continued existence of any designated endangered species, result in the destruction or adverse modification of the critical habitat listed for such species, or cause or contribute to the taking of any endangered or threatened species.
- If a proposed landfill would be located within 500 feet from a dwelling, school, or hospital that was occupied on the date when the owner first applied for a landfill permit, unless the owner consents in writing.
- If a hydrogeological investigation determines that groundwater below a proposed landfill cannot be adequately monitored and if KDHE does not approve alternative solutions.
- Other potential problems associated with human health, the environment, safety, and public nuisances that could not be readily corrected to KDHE's acceptance.

  * Some landfills are exempt from one or more of these requirements.

j. *My primary concern is the fact that you are in step five of what looks like a six or seven step process and I am just now being given the opportunity to be involved in the process. The public notices were only published in Kansas papers. Because polluted water does not know to stop at the Kansas border, I believe that the state of Kansas should be a good and responsible neighbor to Oklahoma and involve the citizens of Oklahoma in this process.*

In light of comments such as in the first sentence above, KDHE has begun a new practice of holding public participation meetings when permit applications are received for new landfills and in some cases, major expansions of existing facilities. KDHE publicizes meetings and hearings through public notices, press releases, and invitations to local government officials.

Some Oklahomans expressed their concerns about contamination migrating from the landfill into the Chikaskia River and then into their state. However, studies of this landfill and knowledge of environmental systems show that this is a highly unlikely possibility.

k. I believe the most important factors to consider when siting a landfill are the geology, the potential for groundwater contamination, and the quantity and quality of water at risk. Surprisingly, from the very beginning, your department has not directly addressed these very important issues and has refrained from releasing information to the public regarding the geology and hydrology of the area near the site.

KDHE also considers hydrogeologic and surface water conditions to be very important issues in landfill siting. These issues were addressed throughout the permitting process.

One of the first steps in evaluating the landfill site was an extensive hydrogeologic investigation performed under the direction of a licensed Professional Geologist. KDHE staff provided oversight of that investigation, as well as observing key activities firsthand. KDHE collaborated with the Kansas Geologic Survey in reviewing the hydrogeologic investigation and related issues.

Surface water issues were also addressed in the planning, design, and review of this landfill. Activities included: a wetlands survey by a qualified professional; collaboration with the Kansas Department of Wildlife and Parks on habitat protection; development and review of wetland mitigation plans; development and review of storm water management and pollution control plans; etc.

Once the public comment period began, KDHE followed the standard practice of not responding immediately to public comments, but instead gathering the comments and reviewing them systematically for a more complete response later. This is necessary because it would be an inefficient use of agency personnel to respond to each public comment at the time it was submitted.

However, KDHE repeatedly and promptly answered procedural questions throughout the review process (including during the public comment period). The agency also responded promptly and thoroughly to open records requests throughout the review process (including during the public comment period).

l. At the zoning hearing for the special use permit, the KDHE staff did not present any information regarding specific conditions at the proposed site. KDHE claimed they did not have information concerning the conditions of the groundwater in the area of the landfill. KDHE does have this information. If there was fairly available regional information on the geology and groundwater resources of this site then I believe the permit would have been denied at the local level. I am surprised Kansas laws permit land to be zoned for a municipal waste facility before an assessment is conducted on the geology and hydrology on the region being zoned.

At the request of Harper County officials, KDHE made a presentation at the zoning hearing to explain the regulatory requirements and permit review process. KDHE expressly stated that an application had not been received and reviewed yet, so the agency could not address specific questions about the site. However, KDHE did present regional geologic information

that was readily available from Kansas Geologic Survey bulletins and other sources during that presentation.

For the most part, county officials could have required a hydrogeological study as a condition for applying for the special use permit. The county deferred to KDHE for evaluation of health and environmental issues, and focused instead on land use issues. However, the county did include some environmental conditions in the special use permit. This focus on land use is consistent with the statutory intent. Even if land gets zoned for a landfill, it would be illegal for anyone to construct and operate a landfill there unless or until KDHE issued a landfill permit for the site.

m. *Due to the limestone, dolomite and other formations in the area, karst terrain may quite possibly be a part of the geology of the area. EPA and Kansas laws both state that landfills may not be built on unstable areas and karst terrain is an unstable formation. Does this information show up in the application to KDHE? Probably not. Does that mean that karst terrain is not in the area? That means that often important items are left out of the application.*

See Comment 2jj.

16. <u>Natural gas pipeline and other utilities on the site</u>

a. *I have a problem with the pipeline issue. If you permit them, they are going to start construction. I think that thing really needs to be addressed before you guys even permit anything because it is a utility. It is dangerous and I am a mile and a half away and I really don't want to have to deal with what happened and what we saw in Hutchinson.*

This comment refers to a small natural gas pipeline on part of the Plumb Thicket Landfill property, and a natural gas explosion that occurred in Hutchinson when vast underground storage systems failed. Prior to receiving the landfill permit, Waste Connections and the utility company reached an agreement and relocated the small natural gas pipeline so it would be out of the way if and when the landfill was permitted and constructed. This type of pre-permit construction (utility relocation) does not violate the landfill permit rules because it is not construction of a landfill.

b. *There are a couple easements across the property and I don't know how you can issue a permit when the oil company has a pipeline going across. Also, I think that John Patterson has a lease on the pasture. Does anyone honor his lease? I don't think Waste Connections can go in and move him off the property even if they own the property.*

It is not uncommon for landfill properties to include utility easements in areas not used for waste disposal. As previously mentioned, the natural gas pipeline was relocated already.

The property owner, Waste Connections, can negotiate a lease for agricultural use of buffers and other non-disposal areas if they choose to. The owner has informed KDHE that they

intend to allow such agricultural use as long as it does not interfere with the landfill operations or present environmental problems.

c. *We have a concern with the word 'if' when used in the context of properly locating and potentially plugging the numerous oil and gas exploration wells ranging from the seismic and core hole drilling to the actual deep drilled hydrocarbon producing wells.*

See Comment 2gg.

d. At least two rat holes 100 feet deep are present in the proposed landfill footprint and to the south of the footprint in the buffer zone.

According to communication with KCC personnel, rat holes in south central Kansas are no deeper than 30 feet below ground surface. Waste Connections is required to identify and plug all borings in the landfill footprint in accordance with an approved work plan. See Comment 2gg.

e. Each deep (oil) well bore required a working pit and reserve pit which are still in situ and uncovering these old cuttings and placing them on the exterior berm could cause potential leaching of salts into the groundwater."

Any leaching of such material is currently occurring at the site. Therefore, the excavation and movement of chloride-contaminated soil would not change the current groundwater quality of the site.

f. We would comment that although the deposition of the Harper Siltstone and the Ninnescah Shale is basically horizontal, most true fractures tend to be vertical in any formation, thus another potential conduit for pollution."

Very few vertical fractures were found at the site and the bedrock has an extremely low vertical hydraulic gradient.

17. <u>Preservation of Natural/Recreational Land</u>

a. In Harper County Kansas they are in the process of allowing a mega regional landfill to be put into the middle of 960 acres of undisturbed native grassland with natural springs and ponds just two miles from the Chikaskia River. This land has been kept in its native state and has been an unofficial wildlife refuge.

KDHE requested input from various agencies about whether this site contains any original prairie grasses that might be subject to protection. The agency received no information to substantiate that. Kansas Department of Wildlife and Parks has approved the landfill location.

b. For over 50 years the Boy Scouts used this area for camping.

KDHE appreciates receiving this information. However, this does not prohibit a landfill on the property.

c. *This plan will ruin what is a beautiful, unique place in Kansas.*

KDHE staff agree that the site is beautiful. Based on topography, soil type, vegetation type, surface features, and other parameters the site does not appear to be unique. While landfill operations will impact the aesthetic qualities of the site, after closure it will revert back to grassland.

d. *The ecological balance in the northeastern part of Harper County will be drastically affected when the natural spring water, according to the plan on file, is prevented from leaving the site. Cropland will yield less and pasture water for cattle will dry up.*

Calculations show that the post-development discharge rates will be similar to pre-development discharge rates.

e. *In this location as in wet periods and perhaps even during dry spells the water table is likely to be near enough to the surface to be designated as wetlands.*

Most existing wetlands at the site will be preserved, and some will be enhanced. Some new wetland areas will be created as mitigation for a small area of isolated wetlands that will be removed.

f. *During the Permian Period, about 260 million years ago, several thousand feet of shale, siltstone, and sandstone – along with interbedded layers of gypsum and dolomite – were deposited in Kansas. These Permian deposits have been exposed by erosion on the Plumb Thicket landfill site. This type of landscape is what the Plains Indians called the "Medicine Hills" who called the major streams that flow from them "Medicine River". They believed that spirits in the hills and streams helped cure their illnesses and hastened the healing of wounds. I imagine the Plains Indians traveled to Plumb Thicket and collected the medicine water from the natural stream originating on the site. This is sacred ground and should be protected!*

KDHE requested input from Native American groups and the Kansas Historical Society about whether this property contains any artifacts or sacred sites that might be subject to protection. The agency received no information to substantiate that. The Kansas Historical Society approved the landfill location.

g. *Plumb Thicket is true wilderness that has been well preserved by man since the Indians roamed this land many years ago. For the past 100 years, this location has been used primarily for recreation: family picnics, swimming, fishing, hunting and camping.*

While Plumb Thicket is a beautiful location, it is not considered "wilderness". Prior to issuance of the landfill permit the site had utilities on it including active and plugged gas and oil wells, an active small natural gas pipeline, and overhead electrical transmission wires. Public roads surrounded the property. A small dirt road ran through the property. There was a hunting lodge and a storage building located on the property. Areas were fenced off and used for cattle grazing. Cattle ponds had been constructed. Cattle had caused ecological damage to Freeman Canyon Creek and associated wetlands, which are critical habitat for a threatened/ endangered species of fish.

In addition, prior to issuance of the landfill permit the current owners performed a number of construction activities on the site including clearing, grading, utility relocation, storm water management, and improved access roads. These activities were allowed without a landfill permit because they are not unique to landfill construction.

Based on all of these human activities, both by previous owners and the current owners, the site is not "wilderness". Furthermore, the site was not just used for recreational purposes in the past.

h. *I think it would be important for KDHE to revisit the site before making a final decision on the permit application. The application claims there are only 0.3 acres of isolated wetlands in the footprint area. Perhaps when they calculated the acres it was a dry year. This spring, however, you will find the isolated wetlands are continuous across the entire site. A soils map of Plumb Thicket shows several intermittent streams running through the footprint. This year these springs are very active and flowing.*

KDHE staff visited the site numerous times between August 2001 and the present. Wetland conditions did not appear to vary dramatically during that time.

The 0.3 acres of wetlands impact was determined by a consultant using standard wetland delineation techniques. The U.S. Army Corps of Engineers (ACOE), which exerts regulatory authority over waters of the United States including most wetlands, concurred with the consultant's findings and declined jurisdiction over the small, isolated wetlands within the landfill footprint.

KDHE requested input from ACOE with regard to your comment. ACOE informed the agency that they reconsidered their original determination based on public concerns, and ACOE reconfirmed their position not to assert jurisdiction over the small, isolated wetlands.

Based on ACOE's input and other data, it is unclear whether drought conditions existed at the time of the wetland determination, or if such conditions could have significantly affected the wetland delineation. It seems unlikely that short-term drought conditions would significantly affect wetland delineations because the key wetland indicators are hydrology, hydrophilic vegetation, and hydric soils. There does not have to be standing water at the time of the delineation to denote a wetland. The evidence of intermittent water, and presence of wetland vegetation and soils would usually persist during short droughts.

KDHE recognized the presence of at least one intermittent stream within the area designated for the landfill footprint. KDHE required the applicant to check with the Kansas Department of Agriculture, Division of Water Resources (DWR) regarding the potential stream impacts. DWR determined that the features in question did not meet the regulatory definition of "streams" based on the size of the contributing drainage areas.

The uphill/upgradient segment of these natural drainage ways will be removed when the landfill is constructed. Storm water runoff from the landfill property (other than from open waste disposal areas) will still flow into the natural drainage ways, so they will still function consistent with pre-development conditions. Existing wetlands elsewhere on the property will be enhanced to mitigate for the loss of 0.3 acres of small, isolated wetlands.

18. <u>Wildlife issues</u>

a. *The Wildlife Department has given their okay to this landfill even though the Arkansas Darter, a fish listed on the Endangered Species List was found in the ponds and springs on this property. This property also is thought to be home of the endangered Streckers Chorus Frog.*

The Kansas Department of Wildlife and Parks (KDWP) reviewed this application extensively with regard to potential impacts to critical habitat for threatened or endangered species. As a result of KDWP's review, the applicant altered their original design to avoid disturbing Arkansas Darter habitat.

KDWP did not require mitigation for disturbances to potential habitat for Streckers Chorus Frog, because that species was not found on the property. Nevertheless, Waste Connections plans to enhance or recreate "wallows" on the property to provide habitat for that species if it exists on or migrates to the property.

The landfill will incorporate numerous methods to prevent pollution in the habitat areas on the property, or any releases from the waste disposal area. These methods were discussed at length in previous responses.

b. *WCI's proposal is to move the pipeline outside the footprint and it would have to cross a 600-foot span of the canyon. This would require considerable dirt to be moved to support the pipeline. Isn't the canyon area to be preserved and protected from construction to protect the endangered species?*

Based on KDHE's observations of the pipeline relocation project that occurred in June 2003, fill soil was placed in a "draw" (small ravine) east of Freeman Canyon. The draw is not part of the protected, critical habitat. Silt fences and other measures were employed to prevent impacts to Freeman Canyon Creek.

c. You said there would be a mitigating factor of six to one on the wetlands that are going to be affected by this municipal waste site. The Department of Parks and Wildlife was here yesterday said they would not be fully functioning wetlands, they were only concerned about the breeding habits of a frog. Wetlands serve many important functions such as preventing flooding, holding water retention, and biological processes that are important to decomposition. If you are removing the overburden soil, which already holds the water, these wetlands are going to become even more important for water protection. I'd like to know why you are not creating fully functioning wetlands?

It appears that something was taken out of context. Some of the existing wetlands on the property are not fully functioning as they were damaged by cattle watering and other activities under previous ownership. As part of the required mitigation, Waste Connections will be restoring the function of some of the existing, damaged wetlands. The landfill will also include a number of terraces, drainage channels, detention and retention ponds that will serve many of the functions of wetlands.

19. <u>Effectiveness of corrective action, if necessary</u>

a. So how is KDHE going to 'fix' a leaky landfill?

As previously explained the landfill is designed and constructed to prevent leaks. However, in the event leaks occurred Waste Connections would be required to take corrective actions.

The type of corrective actions could depend on the nature of the problem. For example, if a liner were damaged during construction, it would be repaired (patched or otherwise reworked) prior to liner approval.

Alternatively, if a leak is detected after waste is disposed in the landfill corrective action might include other measures if liner repairs are not feasible. Some old landfills (not constructed and operated to today's standards) that leaked have installed trenches and/or wells to remove contaminated groundwater and treat it, preventing contamination from flowing offsite.

While it is important to consider how leaks would be addressed, it is also important to consider that the liner system for this landfill has a very low likelihood of leaking. There is no known example of this type of landfill liner leaking when it is constructed properly.

b. We would like to have a thorough outline guaranteeing the protection of the Chikaskia River waters and exactly what would be done in the event that contamination enters the Chikaskia River either underground or above ground.

While it is extremely unlikely that contamination from the Plumb Thicket Landfill would ever enter the Chikaskia River, it would be irresponsible to "guarantee" that such an event could never occur. These responses have already described the extensive measures that will be used to prevent release of contamination from the landfill. Such measures will include

competent bedrock under the landfill, composite liner system, leachate collection and management system, screening waste to prevent disposal of illicit hazardous waste, minimizing leachate production by controlling storm water run-on and limiting liquid disposal, preventing leachate runoff, properly managing storm water runoff, monitoring groundwater to determine if any releases occur, etc.

In the very remote chance that contamination from the landfill enters the Chikaskia River, immediate action will be taken to prevent further releases and to assess the impact of the release. Appropriate corrective action would be taken to address the release, depending on the type and severity of contamination. Corrective action would almost certainly include analyzing water quality impacts, at a minimum, and could also include containment and clean up if necessary.

c. *How can a river ever be decontaminated once it is made unsafe, and at what cost?*

As noted above, the risk of Plumb Thicket Landfill contaminating the Chikaskia River is very low. Chances are much higher that other sources, such as agricultural and urban runoff, would contaminate the river.

Rivers throughout the country have been "decontaminated" in a variety of ways including litter removal, eliminating/reducing sources of pollution, removing contaminated sediment, etc. The costs vary widely depending on the nature and extent of pollution and the degree of cleanup.

d. *Near Brooks Landfill in Wichita, I understand they found polluted water. They are going to have to come up with some money now, hire some consultants and check it out. If that happens here in Harper County, who is going to come up with that money?*

As background, it is important to understand that the situation at Brooks Landfill was much different than a conceptual problem at the Plumb Thicket Landfill. For one thing, the hydrogeologic setting is dramatically different at the two sites. Brooks Landfill was located over the highly permeable alluvial (sandy) aquifer along the Arkansas River. Plumb Thicket Landfill is outside the alluvial zone of the Chikaskia River, and will sit on low permeability bedrock.

Secondly, the contamination from Brooks Landfill was primarily from bulk quantities (drums) of liquid hazardous waste disposed in the landfill prior to current regulations. Such hazardous waste is not allowed in the Plumb Thicket Landfill.

Thirdly, the part of Brooks Landfill that leaked did not have a Subtitle D composite liner and leachate collection system. Plumb Thicket Landfill is required to include those containment features.

Brooks Landfill was owned and permitted to the City of Wichita. Therefore, the City has had to fund the corrective actions (evaluation, containment, and cleanup) associated with the groundwater contamination.

If contamination leaked from the Plumb Thicket Landfill the owner and permit holder, Waste Connections, would have to fund the corrective actions. KDHE has determined that the company has adequate financial strength and qualifications to run a landfill of this type. Again, while the public seems most interested in considering conceptual worst-case scenarios, the fact is that the risks of such catastrophic failures are extremely small.

20. Inspections and complaints

a. *Who is going to be in charge of policing this area if they should go ahead and get approved? If I have a complaint, who do I go to?*

Staff from the KDHE South Central District Office in Wichita will perform routine inspections of Plumb Thicket Landfill to verify that it is operating in compliance with state regulations and permit requirements. They will also follow-up on complaints. If you have any concerns about operations at this facility, please contact the KDHE South Central District Office at (316) 337-6020.

b. *Who is responsible for inspecting loads?*

The landfill operator, Waste Connections, will be responsible for inspecting loads to ensure that only allowable waste is disposed in the landfill. KDHE will check to determine that Waste Connections performs load inspections at the frequency and in accordance with the methodology specified in the approved operating plan.

c. *Not enough inspections (2 per year?); every month is a better plan.*

KDHE generally inspects municipal solid waste landfills at least twice per year to determine compliance with the statutes, regulations, and permit requirements. However, KDHE staff will also follow-up on complaints as appropriate, provide technical outreach and guidance as necessary, and oversee construction of the liner and final cover.

Furthermore, based on the Special Use Permit issued by Harper County, Waste Connections is required to pay an annual fee to the county to cover the cost of landfill inspections by county staff. It is very likely that the overall rate of inspections will be more frequent than once per month.

21. Pollution and disease

a. *The ground is one of the highest hills in the county and the wind will be a constant hindrance to prudent operations of a landfill and potentially spread debris and air pollution for miles in all directions.*

All landfills in Kansas (and most other parts of the country) face the challenge of controlling litter, which is exacerbated by high winds. Waste Connections will be responsible for controlling litter just like all landfill operators.

Landfill operators typically employ several techniques to minimize windblown litter. They use fencing or screens, position unloading trucks in wind-sheltered areas when possible, apply cover soil or otherwise weight down the waste as necessary, and sometimes temporarily refrain from emptying trucks during very high wind conditions.

Despite these control efforts, some litter escapes from the landfill disposal area. This is particularly true of lightweight grocery store plastic bags and lightweight paper products. Waste Connections, like all landfill operators, will be responsible for promptly picking up litter emanating from the landfill.

The landfill's location on top of a hill is not anticipated to significantly affect potential sources of air pollution, such as dust and landfill emissions. Regardless of location, landfill operators are required to control dust and emissions. Dust is usually controlled by limiting the size of disturbed areas and wetting down dirt roads as necessary. Emissions of landfill gas (methane, carbon dioxide, and trace gases) are controlled primarily through collecting the gas and either flaring it, using it to generate heat or electricity, or piping it to customers for such use.

b. *The landfill will bring trucks into the county, which will emit carbon monoxide, nitrous oxide, and diesel emissions into the air, and potentially leak motor oil onto the ground the likes of which this county has never seen.*

Actually, the number of waste trucks entering Harper County is not expected to change appreciably since Waste Connections was already hauling Wichita's trash through Harper County to Oklahoma before the landfill permit was issued. In fact, the travel distance of those trucks through the county will be reduced considerably – instead of going through the whole length of Harper County, most Waste Connections transfer trailers from Wichita will just travel a few miles into Harper County's northeast corner. Consequently, any environmental impacts to Harper County associated with the waste trucks is expected to diminish considerably.

c. *How about the number of landfills that have polluted rivers, streams, or groundwater in the last 40 years?*

It is easy to understand the public concerns about landfills when one considers the way solid waste was managed in the past. Trash was often disposed into rivers or in open dumps along riverbanks and in ravines. Hazardous waste was commonly dumped in as well. Quite often the trash would be accidentally or intentionally set on fire, which would produce harmful air emissions. The open dumps attracted and increased the number of flies, rodents, and other

disease vectors. Surface waters and groundwater were contaminated by runoff and seepage from the dumps.

Conversely, modern municipal solid waste landfills are designed, constructed, and operated in ways to prevent those problems. Therefore, it is not particularly relevant to compare modern landfills to the old dumps. Environmental impacts from modern landfills have been relatively few and significantly less harmful than impacts from the old dumps.

d. *In reading the April-June, 2003, Vol. 15, No. 2 "Recycling in Kansas Newsletter", it stated that 20 of the 50 landfills in Kansas are reported by KDHE to be contaminating the groundwater. Why is this public information withheld?*

KDHE does not withhold public information. It might be that you just did not hear about this before. Actually, groundwater contamination has occurred at more than 50 permitted landfills in Kansas, including several landfills that have closed. The statistic you referenced might have focused on landfills that are still in operation.

Most of the contamination is limited to landfill sites, although in a few cases groundwater contamination has migrated up to approximately one mile from the landfills. KDHE is monitoring the status of each site and in no case has contamination affected public health. In some cases the contamination is being remediated, while in other cases it does not pose any real threat.

Once again, it is important to point out that the groundwater contamination being discussed here resulted from old landfills that were not designed, constructed, or operated to current standards. Plumb Thicket Landfill and other modern landfills employ numerous techniques to prevent such contamination.

e. *Birds carry and spread pathogens such as coccidiosis, both mechanically on their feet and systemically in their droppings. Rats and mice spread pathogens through urine such as leptospirosis, which can cause abortion. Waste Connections says they will control the rodents. How will they do that?*

KDHE is not aware of any incidences in which modern Subtitle D landfills, such as Plumb Thicket Landfill, contributed to the spread of diseases. Quite the opposite, modern landfills prevent diseases by providing sanitary disposal of solid waste instead of open dumps used in the past.

Disease-spreading animals are controlled in several ways at modern landfills. Waste is compacted and covered each day, substantially limiting any access by insects, birds, rodents, or other animals. If necessary, landfills may use methods to repel birds such as wires, auditory measures (such as recorded birds-of-prey calls), or actual birds of prey. The landfill equipment can also be a deterrent to birds. If necessary other methods such as pesticides, culling, and traps may be used. At most landfills, it is not usually necessary to employ all of these methods – daily cover alone seems to be the most effective method.

f. Fires will occur in the landfill. Will Waste Connections or KDHE see that fire fighting equipment is maintained on the site? The smoke and soot from these burning materials will settle on vegetation for many miles around this site. This vegetation when consumed by animals can depress the immune system and destroy hepatic cells that detoxify toxins that are supplied to it by the blood vascular system. Does KDHE have a monitoring system for the vegetation around this site?

The state began regulating landfills in 1976. Some fires have occurred in municipal solid waste landfills since then. These tend to be small fires that are quickly extinguished, although at least one case involved subsurface smoldering that continued at a very low rate for some months.

Larger fires have occurred at construction and demolition landfills. However, since Plumb Thicket Landfill is a municipal solid waste landfill this response focuses on fires at that type of landfill.

Landfill fires have started from hot loads (e.g., embers from burn barrels), hot equipment contacting waste, sparks, and possibly from cigarettes and lightning strikes. Although landfill fires are prohibited, it is not always possible to prevent these types of accidents.

When fires occur, landfill operators are required to take immediate action. Usually they employ onsite equipment to douse or smother the flames before it spreads. If necessary, they call the local fire department for assistance.

There is no data available, to KDHE's knowledge, on the quantities, characteristics, and effects of emissions from these accidental fires at municipal solid waste landfills. However, given that the fires have been small and infrequent, it would appear that the health and environmental effects are insignificant.

Vegetation around landfills is not routinely monitored for airborne toxins from fires. In the event that a large landfill fire occurs, KDHE may conduct air quality monitoring and other tests to evaluate health and environmental impacts.

g. If there is a leak of the diesel storage tank, it will drain right into Freeman's Canyon and will threaten the survival of the endangered species. Will KDHE require the moving of the diesel storage tank to prevent this possible threat?

In the design plans for Plumb Thicket Landfill, Waste Connections proposed a diesel tank to store fuel for onsite equipment. They proposed to locate the diesel tank next to an access road for ease of refueling vehicles, which happened to put the tank near a storm water detention pond. If the tank spilled and if the diesel fuel was not trapped in the secondary containment system (steel or concrete basin) around the tank, it would not drain into Freeman Canyon but rather downstream from there.

KDHE required Waste Connections to obtain a storage tank permit unless it is exempt (depending on the size of the tank). KDHE also questioned the tank location and in response Waste Connections added tertiary containment (earthen basin). In the very unlikely event of tank failure, and secondary and tertiary containment failures, Waste Connections would isolate (prevent flow out of) the nearby storm water detention pond until the diesel was cleaned up.

h. *The trucks will only be tarped which is no guarantee trash will not get out because tarps do tear or get loose. Therefore our highways would get cluttered with a lot more trash, which would mean our ditches and lawn will be collecting the trash, which will be an eyesore and a problem to keep maintained.*

Waste Connections' transfer trailers from Wichita were traversing Harper County on their way to and from Oklahoma before Plumb Thicket Landfill was permitted. Once Plumb Thicket Landfill becomes operational, most of those trucks will travel only in a small part of the northeast corner of Harper County. Therefore, any litter from those trucks could be expected to diminish, not increase. KDHE is not aware of any litter problems associated with Waste Connections transfer trailers.

While there are occasional problems with tarps on transfer trailers, most litter probably comes from careless individuals who toss trash out the window or fail to tarp loads. Kansas regulations require trash haulers to contain waste within the vehicles. If you observe violations of this requirement, you may report them to the KDHE South Central District Office in Wichita at (316) 337-6020.

i. *The noise and dust pollution will be great and will disrupt the families living and farming in that area.*

It is unlikely that noise and dust from construction and operations at the landfill site would be noticeable offsite. Noise will be dissipated due to the buffer distances. Dust will be controlled primarily through wetting haul roads as necessary. However, if noise and dust from onsite activities become a public nuisance KDHE may require appropriate noise reduction measures and enhanced dust controls.

KDHE does not usually regulate noise and dust from traffic on county roads and state highways. That is considered a local control issue.

22. <u>Public comments in favor of the landfill</u>

As previously stated, KDHE received a number of public comments in favor of the landfill. KDHE does not believe it is necessary to provide responses to the favorable comments, since the agency's issuance of the landfill permit demonstrates general concurrence. Nevertheless, some representative favorable comments are listed below for informational purposes.

a. *I feel the County Commissioners' decision will have a huge impact to the financial stability of this county. I do support having the landfill in Harper County because of the positive financial impact, which the county needs.*

b. *No site would have a 100% favorable decision from our residents but as usual only the opponents have had the major forum and expressed the opinion of a small minority. I feel the publicity has expressed only the negatives, most of which is not based on facts and the public has not had the benefit of input from our majority of property owners.*

c. *I have researched the liner material, High Density Polyethylene, and concluded it is probably the best material for this purpose. My company uses this material for acid holding tanks. I especially like the welding procedures the Waste Management Company employs. I do not believe the liner material will fail its purpose and create leaks to contaminate the soil or the water source.*

d. *A settlement has been achieved and the natural gas pipeline will be relocated pending any governmental approvals as necessary. In light of the settlement, White Pine Petroleum Corporation and its officers, directors, and agents, hereby withdraw their testimony and the letter of opposition to you of April 3, 2003.*

e. *After attending the April 2nd informational meeting at the Chaparral High School in Anthony, Kansas about the above-captioned proposed landfill, I concluded from the presentation made by KDHE that the technical information pertaining to this site had been completed and that it all met federal, state and local requirements. From a very reliable source, I understand that the White Pines Oil pipeline situation has been mitigated, and that the seismographic borings concern, number and depth, has been addressed. With these two issues aside, no truly new technical issues have arisen despite the public comment period being extended to May 16th. Given those facts, further delay in permitting this project is inordinate. I urge you to act decisively and assure the prompt issuance of the permit for the Plumb Thicket Landfill project.*

f. *The people supporting the landfill have been very quiet and there is a major reason for this action. The actions of the group opposing the landfill in Harper County are very vocal and intimidating. What reasonable person has the stamina to counter this type of action? What business has the nerve to stand up and say I support the landfill? We fully trust the ability of KDHE to make the decision if the permit should be issued. Therefore, we are making the statement that we support the Plumb Thicket Landfill in Harper County.*

g. *The Plumb Thicket Landfill location being considered by KDHE offers several advantages for the aviation industry in Sedgwick County, the region, and the State of Kansas. Most importantly, the location being considered will not affect flight safety of airport operations or aviation manufacturers.*

h. *I was a member of the Harper County Economic Development Council when the possibility of a landfill was first discussed. As a member of HCEDC, I visited the WCI landfill at*

Garden City to see for myself what was being discussed. I saw the liner, the care taken to contain the waste, the documentation of testing by WCI and KDHE, and the minimal impact to the surrounding houses and properties. After that visit, and after we compiled a very detailed Economic Impact Analysis, the HCEDC voted 6 to 1 to support the landfill application.

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Staff from the KDHE South Central District Office in Wichita will perform routine inspections of Plumb Thicket Landfill to verify that it is operating in compliance with state regulations and permit requirements. If you have any concerns about operations at this facility, please contact the KDHE South Central District Office at 316-337-6020.

Statutes and regulations referenced in this letter can be viewed at http://www.kdhe.state.ks. us/waste. The Web site also includes other information such as policies, technical guidance documents, facilities database, etc.

Thank you for your participation in the public comment process on the referenced application. If you have any questions regarding these responses, please contact Dennis A. Degner at 785-296-1601 or via e-mail to ddegner@kdhe.state.ks.us.